

GOVERNMENT OF INDIA

DEPARTMENT OF ARCHAEOLOGY

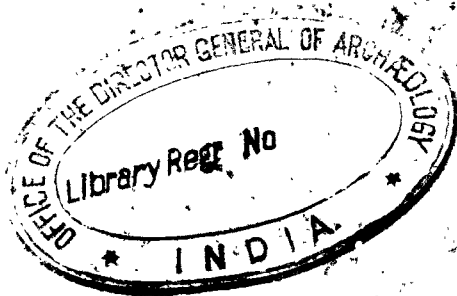
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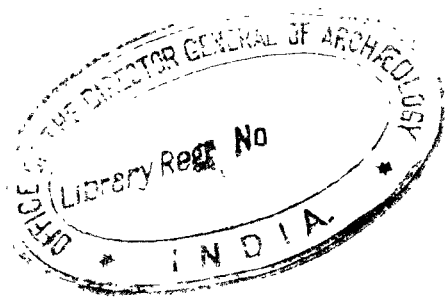
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THE  
JOURNAL  
OF THE  
ROYAL GEOGRAPHICAL SOCIETY.

VOLUME THE FORTY-NINTH.  
25256



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J.R.G.S.

1879.

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# Royal Geographical Society,

1879.

## REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 26TH MAY.

THE COUNCIL have the pleasure of laying before the Fellows the customary Annual Report on the financial and general condition of the Society:—

*Members.*—The number of Fellows elected during the past year (ending April 30th, 1879) was 170, besides two Honorary Corresponding Members. In the previous year, 1877-8, the total elections of Fellows numbered 187. In 1876-7 the number was 292, and in 1875-6, 266. The losses in the past year have been, by death 80, by resignation 54, and by default of subscription 34, making the net increase for the year, two. In the year 1877-8 the net increase was 49; in 1876-7, 138; in 1875-6, 149; and in 1874-5, 202. The Society has also lost by death three Honorary Corresponding Members.

*Finance.*—As will be seen by the annexed Balance Sheet, the total net income for the financial year ending 31st December, 1878 (exclusive of balance in hand), was 8124*l.* 10*s.*, of which 6017*l.* consisted of entrance fees and subscriptions of Fellows. In the previous year, 1877, the total net income was 7950*l.* 1*s.* 11*d.*, and the amount of subscriptions, &c., 6099*l.*; in 1876, 8611*l.* 11*s.* 8*d.* and 7109*l.* 11*s.* The amount of total net income just stated for the past year included a legacy of 540*l.* from the late Admiral Sir George Back. A legacy of 500*l.* formed also part of the stated income for 1877.

The net expenditure for the past year (exclusive of investments and balance in hand) was 6361*l.* 9*s.* 6*d.*; which includes

a grant of 500*l.* to the African Exploration Fund. The net expenditure in 1877 was 5940*l.* 17*s.* 11*d.*; in 1876, 6870*l.* 13*s.* 1*d.*, and in 1875, 5683*l.* 4*s.* 10*d.* The sum of 3000*l.* was invested in Consols during the year.

The Finance Committee of the Council have held, as usual, Monthly Meetings during the year, supervising the accounts of the Society. The Annual Audit was held on the 16th of April last, the Auditors being, on behalf of the Council, Sir Rawson W. Rawson and Sir Henry Barkly; and on behalf of the Fellows at large, Sir Charles Nicholson, Bart., and S. P. Low, Esq. The cordial thanks of the Council and Fellows are due to these gentlemen for having freely devoted their valuable time to this important task. At the end of their labours the Auditors drew up the following Report to the Council:—

“The Auditors appointed for the examination of the Accounts of the Royal Geographical Society for the year ending 31st December, 1878, beg to report that they have examined the Balance Sheet submitted to them, and compared it with the Cash Book, Bankers’ Book, Petty Cash Book, and other books of account kept by the Society, and have verified the Balance in the Bankers’ Pass Book, checked the entries in the Cash Book, and examined all the vouchers for payments made, and that they have found the same to be correctly stated, and sufficiently vouched.

“They have also had produced to them a letter from the Chief Accountant of the Bank of England, and from Messrs. Cocks, Biddulph, and Co., Bankers, showing that the following investments were standing to the credit of the Society on the 31st December, 1878:—

	£	s.	d.
“ India 5 per cent. Stock .. .. .	1000	0	0
“ Great Western Railway 4½ per cent. Debenture “ Stock .. .. .	1800	0	0
“ London and North-Western Railway 4 per cent. “ Debenture Stock .. .. .	1000	0	0
“ North-Eastern Railway 4 per cent. Debenture “ Stock .. .. .	4000	0	0
“ Great Indian Peninsula Railway Guaranteed “ 5 per cent. Capital Stock .. .. .	4000	0	0

	£	s.	d.
" March Exchequer Bills .. .. .	1000	0	0
" Caledonian Railway 4 per cent. Preference			
" Stock, No. 1 .. .. .	2000	0	0
" Consols (Lambert Donation) .. .. .	526	6	4
" Consols .. .. .	3142	15	10

" The Subscription Register, showing the sums payable by the Fellows of the Society, has been duly kept up, and the arrears outstanding at the close of the year were 1517*l.* Of this amount the sum of 192*l.* is irrecoverable, and the Auditors include the balance of 1325*l.* in the assets of the Society as worth 612*l.* 10*s.*

" The Investments and Assets of the Society on the 31st December, 1878, exclusive of the Map Collection and Library, amounted to 37,101*l.* 16*s.* 9*d.*

" The Auditors have much pleasure in certifying that the accounts, books, and vouchers have been so kept as to render their duties much lighter than usual, and they feel bound to record their appreciation of the great assistance they received from the Chief Accountant.

" RAWSON W. RAWSON,	} <i>Auditors.</i>
" HENRY BARKLY,	
" CHARLES NICHOLSON,	
" S. P. LOW,	

" 21st April, 1879."



## Receipts.

## BALANCE-SHEET

1878.	£	s.	d.	£	s.	d.
Balance in Bankers' hands 31st Dec. 1877 (deducting Cheque not presented) .. .. .	2,240	17	0			
Ditto Accountant's Ditto .. .. .	16	7	1	2,257	4	1
<i>Subscriptions :—</i>						
For the current year .. .. .	3,820	0	0			
Paid in advance .. .. .	522	0	0			
Arrears .. .. .	594	0	0	4,936	0	0
<i>Entrance Fees .. .. .</i>	..	..		531	0	0
<i>Life Compositions .. .. .</i>	..	..		550	0	0
<i>Subscriptions paid in error .. .. .</i>	..	..		74	2	0
<i>Legacy by Admiral Sir George Back .. .. .</i>	..	..		540	0	0
<i>Parliamentary Grant .. .. .</i>	..	..		500	0	0
<i>Royal Premium .. .. .</i>	..	..		52	10	0
<i>Rent of Shop and Cellars .. .. .</i>	..	..		140	0	0
<i>Publications, Sale of, and Advertisements .. .. .</i>	..	..		196	5	8
<i>Dividends :—</i>						
North-Eastern Railway 4 per Cent. Debenture Stock .. .. . 1000 <i>l.</i>	39	8	4			
India 5 per Cent. Stock .. .. . 1000 <i>l.</i>	49	3	4			
Great Indian Peninsula Railway 5 per Cent. Stock .. .. . 4000 <i>l.</i>	236	3	4			
Great Western Railway 4½ per Cent. Debenture Stock .. .. . 1800 <i>l.</i>	75	7	8			
London and North-Western Railway 4 per Cent. Debenture Stock .. .. . 1000 <i>l.</i>	39	8	4			
Exchequer Bills .. .. . 1000 <i>l.</i>	24	12	0			
Caledonian Railway 4 per Cent. Preference Stock, No. 1 .. .. . 2000 <i>l.</i>	78	15	8			
Consols .. .. . 3669 <i>l.</i> 2 <i>s.</i> 2 <i>d.</i>	61	13	8	604	12	4
				£10,381	14	1

REGINALD T. COCKS,  
*Treasurer.*

FOR THE YEAR 1878.

Expenditure.

1878.	£	s.	d.	£	s.	d.
<i>House</i> :—Taxes and Insurances, Repairs, Improvements and Furniture, Coal, Gas and Water-rates, &c. .. .. .	..	..		502	8	5
<i>Office</i> :—Salaries and Gratuities, Stationery and Printing, Postages and Parcels, &c. .. .. .	..	..		1,712	13	0
<i>Library</i> :—Salaries, Books, &c. .. .. .	..	..		503	2	3
<i>Map-Room</i> :—Salaries and Gratuities, &c. .. .. .	..	..		858	15	7
<i>Meetings</i> .. .. .	..	..		235	6	0
<i>Scientific Purposes Grant</i> :—Lecturers' Fees, &c. .. .. .	..	..		175	0	0
<i>Medals</i> and other awards .. .. .	..	..		106	12	0
<i>Publications</i> :—Printing Journal and Proceedings, Maps and Illustrations, &c. .. .. .	..	..		1,742	12	3
<i>Payments</i> in error returned .. .. .	..	..		25	0	0
<i>Expeditions</i> :—						
Donation to the African Exploration Fund .. .. .	..	..		500	0	0
<i>Investments</i> :—Purchase of 3142 <i>l.</i> 15 <i>l.</i> 10 <i>d.</i> Consols .. .. .	..	..		3,000	0	0
<i>Balance</i> in Bankers' hands 31st Dec. 1878 (excluding draft not presented) .. .. .	999	13	0			
Do. Accountant's Do. .. .. .	20	11	7			
				1,020	4	7

£10,381 14 1

Audited and found correct, the 16th day of April, 1879.

RAWSON W. RAWSON,  
CHAS. NICHOLSON,  
S. P. LOW,  
HENRY BARKLY, } *Auditors.*

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec., 1878.

	Year.	Cash Receipts within the Year.			Cash Amounts invested in Funds.			Deducting Amounts invested in Funds; actual Expenditure.		
		£	s.	d.	£	s.	d.	£	s.	d.
In 1856 a Treasury Grant of 1000 <i>l.</i> for the East African Expedition received.	1848	696	10	5	..	..		755	6	1
	1849	778	3	0	..	..		1098	7	6
	1850	1036	10	5	..	..		877	2	10
In 1860 a Treasury Grant of 2500 <i>l.</i> for the East African Expedition received.	1851	1056	11	8	..	..		906	14	7
	1852	1220	3	4	..	..		995	13	1
	1853	1917	2	6	..	..		1675	6	0
In 1869 Legacy of Mr. Benjamin Oliveira, 1506 <i>l.</i> 17 <i>s.</i> 1 <i>d.</i>	1854	2565	7	8	..	..		2197	19	3
	1855	2584	7	0	..	..		2636	3	1
	1856	3372	5	1	533	10	0	2814	8	1
	1857	3142	13	4	378	0	0	3480	19	9
In 1870 Legacy of Mr. Alfred Davis, 1800 <i>l.</i>	1858	3089	15	1	..	..		2944	13	6
	1859	3471	11	8	950	0	0	3423	3	9
In 1871 Legacy of Sir Roderick Murchison, 1000 <i>l.</i>	1860	6449	12	1	466	17	6	5406	3	7
	1861	4792	12	9	1358	2	6	3074	7	4
In 1872 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 2000 <i>l.</i>	1862	4659	7	9	1389	7	6	3095	19	4
	1863	5256	9	3	1837	10	0	3655	4	0
	1864	4977	8	6	1796	5	0	3647	7	10
	1865	4905	8	3	1041	5	0	4307	4	5
	1866	5085	8	3	1028	15	0	4052	15	0
In 1874 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 1041 <i>l.</i> 14 <i>s.</i>	1867	5462	7	11	1029	0	6	3943	17	4
	1868	5991	4	0	1857	3	9	4156	17	10
	1869	6859	16	0	2131	5	0	4646	0	8
	1870	8042	6	1	3802	6	0	3845	10	6
In 1876 Special Parliamentary Grant of 3000 <i>l.</i> towards the Expenses of the Cameron Expedition.	1871	6637	3	7	1000	0	0	3726	4	4
	1872	8119	7	9	1999	4	6	5871	13	2
	1873	7761	18	10	2015	1	8	6697	12	6
	1874	8753	5	10	499	0	0	7876	2	3
	1875	7934	15	10	2002	7	6	5683	4	10
In 1877 Donation of 500 <i>l.</i> by Mr. C. J. Lambert in carrying out the provisions of his father's will.	1876	11,611	11	8	..	..		6870	13	1
	1877	7950	1	11	2538	2	0	8940	17	11*
	1878	8124	10	0	3000	0	0	6361	9	6
In 1878 Legacy of Admiral Sir George Back, 540 <i>l.</i>										

\* This sum includes the Special Parliamentary Grant transferred to the Cameron Expedition Fund in February, 1877.

STATEMENT OF ASSETS—31st December, 1878.

	£	s.	d.
Freehold House, Fittings, and Furniture, estimated (exclusive of Map Collections and Library in- sured for 10,000 <i>l.</i> ).. .. . }	..	20,000	0 0
Investments (amount of Stock), as detailed in the above Report of the Auditors .. .. }	..	15,469	2 2
Arrears due on December 31, 1878 ..	£1517		
Less, irrecoverable .. ..	192		
	£1325		
Estimated at .. .. .		612	10 0
Balance at Bank .. .. .	999	13	0
„ in Accountant's hands .. .. .	20	11	7
		1,020	4 7
Total	£37,101	16	9

*Publications.*—A new form of publication of the ‘Proceedings’ of the Society was commenced in January of the present year, the old ‘Proceedings’ terminating with the 22nd volume. The new series is a monthly publication, containing besides the chronicle of the proceedings of the Evening Meetings, numerous maps and a record of Geographical events throughout the world, together with notices of new books and maps published in various countries. The numbers have hitherto been issued with punctuality on the 1st of each month, and at the end of the year the twelve parts will form a large volume, a complete Index being issued as soon as practicable after the last number. Although attended by a considerably increased expense, the Council have felt assured from the commencement that the new publication would meet with the warm approval of the Fellows. The expense is counterbalanced to a larger extent than was originally estimated, by receipts from advertisements and from sales to the public, upwards of 800 copies being subscribed for by persons who are not Fellows of the Society.

*Expeditions ; Grants of Instruments to Travellers.*—A second grant of 500*l.* was made during the year 1878 to the African Exploration Fund.—Instruments at a total cost of 357*l.* 18*s.* have been supplied to travellers as follows:—Mr. Keith Johnston (for the East African Expedition of the African

Exploration Fund), a complete set, value 170*l.*; Mr. Henry Forbes (for his journey to Celebes), instruments, to the value of 9*l.*; Mr. Simons (for the Exploration of the Sierra Nevada of Santa Martha), instruments, to the value of 15*l.*; Mr. Comber (Expedition to the Congo), instruments, to the value of 57*l.*; Dr. Mullens (for Lake Tanganyika), instruments, to the value of 101*l.*; Captain A. H. Markham, R.N. (voyage to Nova Zembla), instruments, value 5*l.* 18*s.* The instruments lent to Mr. Craven (East Africa) and Lieut. Congreve (Paraguay) have been returned into store, on the termination of the journeys of these travellers.

*Annual Grant for Scientific Purposes.*—The science lectures appointed by the Committee charged by the Council with the administration of the annual grant of 500*l.* for scientific purposes, have been continued during the past year; but only a portion of the grant, viz. 175*l.*, was expended. The following gentlemen were chosen to deliver the three lectures for the Session 1878–9:—Professor A. Geikie, subject, ‘Geographical Evolution’; Professor Rolleston, subject, ‘The Modifications of the External Aspects of Organic Nature produced by Man’s Interference’; and J. Ball, F.R.S., subject, ‘The Flora of the European Alps and its connection with that of other regions of the Earth.’ The large MS. Map of Equatorial Africa, with Bibliographical list of authorities, the compilation of which was entrusted by the Committee to the well-known geographer, Mr. Ravenstein, is making steady progress.

*Library.*—641 books and pamphlets have been added to the Library during the past year; 473 (including all the pamphlets) being donations, and 168 purchased. Besides these, and without reckoning such publications of general interest as the ‘Athenæum,’ &c., 1102 separate parts or numbers of periodicals, ‘Transactions,’ &c., have been received (including those obtained by gift in or towards completion of defective series), many of which complete annual or other volumes.

136 pamphlets and small works have been put into covers on the Society’s premises, and 263 volumes have been bound during the past year.

The sum of 136*l.* 17*s.* 5*d.* has been expended in purchasing books, and the further sum of 87*l.* 0*s.* 6*d.* in binding.

Among the more important accessions are:—Gaimard's '*Voyage en Laponie*' and '*Voyage en Island*'; and Du Petit Thouars's '*Voyage de la Vénus*,' with Atlases complete; Brosset's '*Description*' and '*Histoire de la Géorgie*'; Texier's '*Description de l'Arménie*'; Cartas de Indias (presented by the Conde de Toreno, through H.E. the Spanish Minister); Vander Aa's Collection of Sea and Land Journeys in the East and West Indies, in Dutch, 27 vols. (presented by C. R. Markham, Esq.); Juan and Ulloa's '*Observaciones Astronomicas y Phisicas*' (presented by J. P. Gassiot, Esq.); Sir J. Maundevile's '*Voiage*'; Gerritsz's '*Detectio Freti Hudsoni*'; Bruce's '*Annals of the East India Company*'; Heeren's Political and other Works; the continuation of Burgess's '*Archæological Survey of Western India*,' and Rice's '*Mysore and Coorg*,' with many other official publications referring to India (presented by Her Majesty's Secretary of State for India); '*Encyclopædia Britannica*,' 9th edition, vols. viii. and ix. (presented by Messrs. A. and C. Black); '*Œuvres de Champlain*,' by Laverdière; Wild's '*At Anchor*' (presented by Messrs. Marcus Ward and Co.); a collection of the chief works referring to Arctic Voyages (presented by the Rev. H. Back); a collection of Dutch writings by Professor Veth on the Indian Archipelago (presented by the Author, per P. Bicker-Caarten, Esq.); a collection of Geographical Addresses by the late Sir Roderick Murchison (presented by Kenneth Murchison, Esq.); Kanitz's '*Donau-Bulgarien*'; Paz Soldan's '*Diccionario Geografico del Peru*,' with various writings on South America, by Vicuña-Mackenna, Raimondy, &c. (presented by Señor M. F. Paz Soldan); the completion of Sir H. Lefroy's '*Memorials of the Bermudas*' (presented by the Author, per Messrs. Longman); Fouqué's '*Santorin et ses Éruptions*'; Thomson's '*Through Cyprus with the Camera*'; the current reports and other publications of the U.S. Geographical Survey under Professor F. V. Hayden (presented by him); various publications of the Egyptian General Staff (presented by General Stone); the continuation of the Memoirs and other publications of the Geological Survey of India (presented by the Indian Government, per Dr. Oldham);

the continuation of vol. iii. and the whole of vol. iv. of Reclus's *Géographie Universelle* (presented by the Author); and all as yet published of St. Martin's '*Géographie Universelle*.'

The Library continues to be much consulted by Fellows of the Society and officers of public departments. Reference is also constantly being made to it by students, authors, and artists connected with publishing establishments.

*Map-Room.*—The revision of the classified Register of Maps, and the preparation of an alphabetical catalogue of all the Maps in the Society's Collection, with an index of authors, were decided upon at the Council Meeting of June 3rd, 1878; since which time considerable progress has been made in this work, and the new catalogue is being prepared with a view to its being subsequently printed.

The Council have voted 50*l.* per annum, for four years, to be expended in putting the bindings of the Society's Atlases in good order, and the shelves on which the Atlases are kept have been covered with sliding sashes for their better preservation.

The offer of Messrs. Lund and Blockley, to provide the Map-Room with a Synchronizing time current has been accepted by the Council, and an hourly mean time current is now received in the Map-Room. A case containing a set of traveller's instruments (such as the Society recommend) has been placed in the Map-Room.

Great interest has been evinced by the Fellows of the Society and the general public in the Maps of the Seat of War in Afghanistan and South East Africa. Public officers, students, and the public have made frequent use of the Maps in the Society's Collection. The large Maps have been lent during the year, for the purpose of illustrating many Geographical lectures in different parts of the kingdom.

The accessions to the Map-Room Collection since last Anniversary comprise 468 Maps and Charts on 1426 Sheets; 24 Atlases containing 790 Sheets; and 132 Photographs. Of these 50 Maps and 4 Atlases have been purchased. 5 new Diagrams (Cyprus, South East Africa, Southern Usambara, part of Midian, Cameroons Mountains, and Lake Nyassa) have been constructed on the establishment, and several others have

been corrected. Three large diagrams (Afghanistan, Africa, and Asia) have been purchased. The accessions of the present year are in excess of those of last year by 17 Maps and 19 Atlases on 564 Sheets.

Among the most important additions to the Map-Room are:—308 Sheets of the Ordnance Survey of the British Isles on various scales (presented by the First Commissioner of Works, through the Director-General of the Ordnance Survey). 201 Charts of the British Admiralty, 1 Atlas of Index Charts, and an Atlas of Pilot Charts for the Atlantic Ocean (presented by the Lords Commissioners of the Admiralty, through the Hydrographer). 95 French Admiralty Charts (presented by the *Dépôt des Cartes et Plans de la Marine*). 4 Sheets of United States Charts, and an Atlas of Meteorological Charts of the Pacific (presented by Captain S. R. Franklin, U.S.N., Hydrographer to the Bureau of Navigation). 178 Sheets of the various Indian Government Surveys (presented by Her Majesty's Secretary of State for India, through the India Office). 47 Sheets of Maps, including 21 Sheets of Major Wilson's Map of Afghanistan (presented by the Quartermaster-General). 12 Sheets of the *Topographischer Atlas der Schweiz* (presented by the Chief of the Federal Survey, Berne). 1 Atlas over Kongeriget Denmark (presented by Rear-Admiral C. Irminger). 5 Sheets of the *Kaart over Jydland* (presented by H.E. the Danish Minister). Geological and Topographical Atlas accompanying the Report of the Geological Expedition of the Fortieth Parallel, U.S.A. (presented by Clarence King, U.S., Geologist-in-charge). Geological and Geographical Atlas of Colorado, and an Atlas of the Geological Survey of Wisconsin (presented by Dr. S. V. Hayden). Map of the Turkestan Military Province, constructed by the Turkestan Military Topographical Department. Map showing the Explorations of H. M. Stanley (presented by Edward Weller, Esq.) Map of Madagascar (presented by Dr. Mullens). 16 Sheets of MS. Tracings of the Nile Surveys (presented by General Stone). Adolf Stieler's *Hand Atlas*, Parts I. and II. new edition (presented by Herr Justus Perthes). 15 Sheets of Maps, including two General Maps of Australia, and four of the Colony of Victoria (presented by the Honourable Graham



Berry, Premier of Victoria). 1 Atlas of the Southern portion of the Province of South Australia (presented by Sir A. Blyth). 120 Photographs taken in Damaraland and East Namaqualand, by Mr. W. C. Palgrave (presented by Sir Henry Barkly). A MS. Map of the Nile between Assouan and Wady Halfa (presented by G. Kilgour, Esq.) 40 Sheets of the Special-Karte der K. u. Österreichisch-Ungarischen Monarchie. 17 Sheets of Norwegian Surveys (presented by Lieut.-Colonel Sejersted). 17 Sheets of French Government Survey (presented by the Dépôt de la Guerre).

# ROYAL GEOGRAPHICAL SOCIETY.

## Patron.

HER MAJESTY THE QUEEN.

## Vice-Patron.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G., K.T., K.P., G.C.B.,  
&c., &c.

## Honorary-President.

HIS ROYAL HIGHNESS THE DUKE OF EDINBURGH, K.G., K.T., G.C.S.I., &c., &c.

## COUNCIL.

(ELECTED 31ST MAY, 1880.)

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ABERDARE, The Right Hon. Lord.

## Vice-Presidents.

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BARKLY, Sir H., G.C.M.G., K.C.B.  
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1880.

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(JULY 1880.)

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C = present or past member of Council.

G = Gold Medal.

T = Testimonial of any other description.

S = School prize medal.

p = author of a Paper published in the 'Journal,' or 'Proceedings' of the Society.

\* = Life Compounder.

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1861		Acland, J. Barton Arundel, Esq. <i>Mount Peel, Canterbury, New Zealand. Care of A. Mills, Esq., 34, Hyde-park-gardens, W.</i>
1874		Acland, Sir Thos. Dyke, Bart., M.P. <i>Killerton, Exeter; and Athenæum Club.</i>
1873	p.	Acland, Lieutenant W. A. Dyke, R.N. <i>Care of Dr. H. Acland, Oxford.</i>
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1877		Baker, Rev. Wm. <i>4, Clapton-square, Hackney.</i>
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1878		Baldwin, A. Chas., Esq.

Year of  
Election.

- 1861 Balfour, Colonel David. *Balfour-castle, Kirkwall, N. B.*
- 1876 Balfour, Frederick Henry, Esq. *Shanghai.*
- 1847 C. Balfour, Gen. Sir George, R.A., K.C.B., M.P. 6, *Cleveland-gardens, Hyde-park, W.; and Oriental Club, Hanover-square, W.*
- 1853 Balfour, John, Esq. 13, *Queen's-gate-place, S.W.*
- 1876 Ball, Arthur Edmund, Esq. *Tyne-villa, The Platt-field, Putney, S.W., and 7 and 8, Honey-lane-market, Cheapside, E.C.*
- 1860 C. p. Ball, John, Esq., F.R.S. 10, *Southwell-gardens, South Kensington.*
- 1876 Ball, John B., Esq. *Carisbrooke-lodge, St. John's-road East, Putney, S.W.*
- 1872 Balls, W. H., Esq. 20, *Anerley-road, Anerley, S.E.*
- 1852 Bancroft, Col. W. C. (16th Regt.). *Barracks, Fulwood, Preston, Lancashire.*
- 1873 Bandini, His Highness Prince Giustiniani. *Rome. Care of Messrs. Baring Brothers and Co., 8, Bishopsgate-street-within, E.C.*
- 1878 Banks, Henry B., Esq. 2, *Rue Beauvallet, Havre.*
- 1880 Barber, Elijah, Esq. 50, *Ella-street, Leeds.*
- 1872 Barber, Wm. Cambridge, Esq. *Crossley Orphan Home and School, Savile-park, Halifax.*
- 1874 Barbour, W. Boyle, Esq. *Springvale, Hilton-lane, Prestwich, near Manchester.*
- 1869 Barchard, Francis, Esq. *Horsted-place, Uckfield.*
- 1879 Barclay,\* Charles Arthur, Esq. *Nutfield-court, Nutfield, Surrey.*
- 1873 Barclay, Hugh G., Esq. *Thorpe, Norwich.*
- 1870 Barclay, Wm. L., Esq., B.A. *The Briars, Reigate, Surrey.*
- 1863 Barford, A. H., Esq., M.A. 1, *Cornwall-terrace, Regent's-park, N. W.*
- 1835 Baring,\* John, Esq. *Oakwood, Chichester.*
- 1870 C. p. Barkly, Sir Henry, G.C.M.G., K.C.B. 1, *Bina-gardens, South Kensington, S.W.*
- 1862 Barlee, Frederick Palgrave, Esq., C.M.G. (*Governor of British Honduras*). *Care of G. Lawrence, Esq., 12, Marlborough-road, Lee, S.E.*
- 1868 Barlow, Frederick Thomas Pratt, Esq. 26, *Rutland-gate, S.W.*
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- 1867 P. Barns,\* John W., Esq. 18, *Clarendon-place, Citadel-road, Plymouth, Devon.*
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- 1875 Barrett, Howard, Esq., M.R.C.S. 3, *Tavistock-square, W.C.*
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- 1867 Barrington-Ward,\* Mark J., Esq., M.A., F.L.S. (*Her Majesty's Inspector of Schools*). *Salwarpe-end, Droitwich; and United University Club, S.W.*
- 1833 Barrow, John, Esq., F.R.S., F.S.A. 17, *Hanover-terrace, Regent's-park, N. W.*
- 1877 Barrow, Reuben Vincent, Esq. *Sydney-lodge, Croydon.*
- 1878 Barrow, Samuel, Esq., jun. *Lorne-house, Red-lill, Surrey.*
- 1863 Barry, Alfred, Esq. *St. Bride's Office, 33, Mark-lane, E.C.*
- 1857 Bartholomew, John, Esq. 17, *Chambers'-street, Edinburgh.*
- 1879 Bartlett, Edward J., Esq. *St. Helen's, Cazenove-road, Stamford-hill.*



Year of Election.	p.	
1862		Barton, Alfred, Esq., M.D. <i>Oriental Club, W.; and Myskyns, Ticehurst, Hawk-hurst.</i>
1880		Bartram,* Lieut. George W., R.E. <i>Rocklands, Tunbridge-wells.</i>
1837		Bateman,* James, Esq., F.R.S., F.L.S. 9, <i>Hyde-park-gate South, S.W.</i>
1876		Bateman, John, Esq.
1859		Bateman, John F., Esq., C.E., F.R.S. 16, <i>Great George-street, Westminster, S.W.</i>
1875		Bates, Major C. E. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1873		Bates, General Sir Henry, K.C.B. 2, <i>Sussex-place, Hyde-park, W.</i>
1879		Bates, Rev. J. C. <i>The Vicarage, Castleton, near Manchester.</i>
1866		Bateson-de-Yarburgh, George, Esq. <i>Heslington-hall, York.</i>
1880		Batley, George, Esq. <i>Fern-bank, near Hastings.</i>
1877		Batt, Edward W., Esq. 20, <i>Great Winchester-street, E.C.</i>
1873		Batten, Henry Howard, Esq. 11, <i>Scarsdale-villas, Kensington, W.; and Junior Carlton Club, Pall-mall, S.W.</i>
1866		Batten, John H., Esq. 5, <i>Mansten-terrace, Heavitree, Exeter.</i>
1858		Baxendale, Joseph H., Esq. <i>Worplesdon, Guildford.</i>
1879		Baxter, William Edwin, Esq. 7, <i>Church-row, Stoke Newington, N.</i>
1863		Bayley, H., Esq. <i>Peninsular and Oriental Co., Leadenhall-street, E.C.</i>
1873		Baylis,* Major E. W. D. <i>Guildford-villa, Hilborough-crescent, Southsea, Hants.</i>
1862		Bayly, Maj.-Gen. John, R.E., C.B. 58, <i>Palmerston-place, Edinburgh.</i>
1872		Baynes,* A. Henry, Esq. 19, <i>Castle-street, Holborn, E.C.</i>
1878		Baynes, Donald, Esq., M.D. 15, <i>Bridge-street, Canterbury.</i>
1872		Baynes,* Wm. Wilberforce, Esq., D.L. <i>Campbelton-house, Croydon.</i>
1868		Baynton, Captain Edward. <i>Trafalgar-lodge, Shirley, Southampton.</i>
1874		Beach, W. J., Esq. 56, <i>Church-road, Richmond.</i>
1874		Beall, Geo., Esq., Secretary Local Marine Board. <i>Liverpool.</i>
1874		Beardmore, Nathaniel St. B., Esq. 30, <i>Great George-street, S.W.</i>
1872		Beaton, Capt. John. 13, <i>Palace-gardens-terrace, W.</i>
1854		Beaufort,* William Morris, Esq., F.R.A.S., F.L.S., F.S.S. 18, <i>Piccadilly, W.</i>
1875		Beaumont, A. R. de, Esq. 19, <i>St. John's-park, Highgate, N.</i>
1877		Beaumont, Commander Lewis A., R.N. <i>H.M.S. "Excellent," Portsmouth.</i>
1870		Beaumont,* Somerset, Esq. <i>Hurstcote, Shere, near Guildford.</i>
1851		Beaumont,* Wentworth B., Esq., M.P. 144, <i>Piccadilly, W.</i>
1872		Beavan, Lieut. Reginald. <i>Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1867		Beazeley,* Michael, Esq., M.I.C.E. <i>Care of J. D. Campbell, Esq., 8, Storey's-gate, S.W.</i>
1871		Beazley, Major Geo. G. (83rd Regiment). <i>Army and Navy Club, S.W.</i>
1865		Bebb, Horatio, Esq. <i>Mamhead, Exeter.</i>
1880		Becher, Henry C. W., Esq. <i>London, Canada West. Care of Major J. Andover Wood, 11, Prince's-square, Bayswater.</i>

Year of Election.		
1870		Bective,* Thomas, Earl of, M.P. <i>Underley-hall, Kirkby Lonsdale, Westmoreland.</i>
1875		Bedbrook, W. H., Esq. <i>Blenheim-house, Wimbledon, S.W.</i>
1874		Beech, Geo. Müller, Esq. <i>Care of George Kohle, Esq., 100, Lenthall-road, Dalston, E.</i>
1861		Begbie,* James, Esq. 2, <i>East-India-avenue, Leadenhall-street, E.C.</i>
1860		Begbie, Thomas Stirling, Esq. 36, <i>Wallbrook, E.C.</i>
1853		Belcher, Rev. Brymer. <i>St. Gabriel's; and 32, Warwick-square, Pimlico, S.W.</i>
1874		Bell, H. Douglas, Esq. 6, <i>Marie-terrace, Eastcliff, Folkestone.</i>
1875		Bell,* Joshua P., Esq.
1876		Bell, Thomas, Esq. 15, <i>Upper-park-road, Haverstock-hill, N.W.</i>
1868	p.	Bell, Wm. A., Esq., B.A., M.D. <i>New University Club, St. James's-street, S.W.</i>
1871		Bell, Major W. M. 40, <i>Pall-mall, S.W.</i>
1874		Bell, William Moore, Esq. 37, <i>Charterhouse-square, E.C.</i>
1864		Bellamy, Edward, Esq. 14, <i>Buckingham-street, Adelphi, W.C.</i>
1872	p.	Bellville, Rev. Alfred. 20, <i>Penn-road-villas, Holloway, N.</i>
1863		Belmore, Right Hon. The Earl of, K.C.M.G. 95, <i>Eaton-place, S.W.</i>
1873		Benjamin, Horace B., Esq. 169, <i>New Bond-street, W.</i>
1870		Benjamin, Joseph, Esq.
1857		Bennett, J. Risdon, Esq., M.D. 22, <i>Cavendish-square, W.</i>
1856		Benson,* William, Esq. <i>Langtons, Alresford, Hants.</i>
1830		Bentham, George, Esq., Pres. L.S. 25, <i>Wilton-place, S.W.</i>
1868		Bentley, George, Esq. <i>Upton-park, Slough.</i>
1870		Benyon,* Wm. H., Esq. <i>West-lodge, Ripon.</i>
1859		Berens, H. Hulse, Esq. <i>Sidcross, Foot's Cray, Kent.</i>
1865		Bernard, P. N., Esq. 37, <i>Connaught-square, Hyde-park, W.</i>
1874		Bernays, Louis A., Esq. <i>Care of A. FitzGibbon, Esq., The Rookery, Stanmore, Middlesex.</i>
1879		Berridge,* Robert, Esq. 15, <i>Highbury-grove, N.</i>
1876		Berryman, Edwin W., Esq. 27, <i>Leadenhall-street, E.C.</i>
1872		Berthon, Peter Hy., Esq. 20, <i>Margaret-street, Cavendish-square, W.</i>
1871		Best, Commr. Jno. Chas. <i>Plas-y-n-Viood, Llangollen.</i>
1867		Bethune, Alexander M., Esq. <i>Otterburn, Hamlet-road, Upper Norwood; and 122, Leadenhall-street, E.C.</i>
1842	p.	Bethune,* Adm. C. R. Drinkwater, C.B. 4, <i>Queensberry-place, S.W.</i>
1836		Betts, John, Esq. 21, <i>Freegrove-road, Camden-road, N.</i>
1866		Bevan, William, Esq. 12, <i>Bolton-gardens, South Kensington, S.W.</i>
1876		Bevington, Henry Geo., Esq. <i>Ferndale-house, Lee, S.E.</i>
1876		Bevington, Herbert S., Esq., B.A. <i>Ferndale-house, Lee, S.E.</i>
1877		Bianchi, The Marchese. <i>Padova, Veneto, Italy; and Hanover-square Club, W.</i>
1873		Bibby,* Edward, Esq. <i>Care of John Bibby, Esq., Hart-hill, Liverpool.</i>
1862		Bicker-Caarten, Peter, Esq., Corr. Mem. and Agent Geogr. Soc. of the Netherlands. 30, <i>Northumberland-place, Bayswater, W.</i>

Year of Election.	
1875	Bickers, Edward, Esq., J.P. <i>Care of Messrs. King and Co., Cornhill, E.C.</i>
1876	Bickerstaff, W. M., Esq., J.P. 13, <i>Highbury-terrace, N.</i>
1871	Bickersteth, The Very Rev. Edward, D.D., Dean of Lichfield. <i>The Deanery, Lichfield.</i>
1879	Bickford-Smith, * W., Esq. <i>Trevarno, Helston, Cornwall.</i>
1868	p. Bickmore, * A. S., Esq., M.A., PH.D., Superintendent of the American Museum of Natural History. <i>Central-park, New York.</i>
1866	Bicknell, Algernon S., Esq. 23, <i>Onslow-gardens, South Kensington.</i>
1880	Bidder, B. P., Esq., M.I.C.E., &c. <i>Beech-house, Loughton, Essex.</i>
1871	Biddulph, Geo. Tournay, Esq. 43, <i>Charing-cross, S.W.</i>
1874	Biddulph, John, Esq. <i>Swansea.</i>
1879	Biddulph, * Major-General Sir R., K.C.M.G. <i>Governor of Cyprus.</i>
1865	Bidwell, Charles Toll, Esq. <i>Foreign-office, S.W.</i>
1859	Bigge, Frederick W., Esq. <i>Wavendon-house, Woburn.</i>
1868	Biggs, C. H. Walker, Esq. 7, <i>Freelands-road, Bromley, Kent.</i>
1876	Biggs, Jas., Esq., R.N. 15, <i>Thurloe-place, S.W.</i>
1876	p. Bigg-Wither, * T. P., Esq., C.E. <i>Belmont-lodge, Wray-park, Reigate.</i>
1850	Bigsby, John J., Esq., M.D., F.R.S. 89, <i>Gloucester-place, Portman-square, W.</i>
1858	Birch, John William, Esq. 27, <i>Cavendish-square, W.</i>
1862	Birchill, * Captain B. H. H. <i>Junior Carlton Club, S.W.</i>
1872	Bird, * Richard, Esq. <i>Holt-house, Fulham, S.W.</i>
1879	Bird, Thomas, Esq. 38, <i>Brook-street, W.</i>
1874	Birdwood, Geo., Esq., M.D., C.S.I. <i>Acton, W.</i>
1875	Birkbeck, Edw., Esq., M.P. <i>Horstead-hall, Norwich.</i>
1878	Birks, Harry William, Esq. 161, <i>Brecknock-road, Tufnell-park, N.W.</i>
1867	Bischoffsheim, * Henri Louis, Esq. 75, <i>South Audley-street, W.</i>
1858	Bishop, George, Esq., F.R.A.S. <i>Union Club, S.W.; and The Meadows, Twickenham, S.W.</i>
1861	Bishop, James, Esq.
1876	Bishop, James, Esq. <i>Harcourt-house, Leytonstone.</i>
1870	Bishop, Wm. Henry, Esq. <i>Culverden-lodge, Tunbridge Wells.</i>
1867	Bisson, Capt. Frederick S. de Carteret. 70, <i>Berners-street, W.</i>
1870	Black, Andrew H., Esq. <i>Kingston, Glasgow.</i>
1860	Black, * Francis, Esq. 6, <i>North-bridge, Edinburgh.</i>
1878	Black, Major Geo. Robt. Stewart. <i>Roxeth, Harrow; and Junior United Service Club, Charles-street, S.W.</i>
1849	Blackie, W. Graham, Esq., PH.D. 17, <i>Stanhope-street, Glasgow.</i>
1862	Blackstone, * Frederick Elliot, Esq., B.C.L. 2, <i>Caroline-street, Bedford-square, W.C.</i>
1872	Blagden, Robert, Esq. <i>Junior Carlton Club, Pall-mall, S.W.</i>
1869	Blaine, Henry, Esq. 11, <i>Gledhow-gardens, South Kensington, S.W.</i>
1874	Blair, Major H. F., R.E. 1, <i>Clarendon-place, Hyde-park-gardens, W.</i>
1865	Blake, Brig-Gen. H. W. 10, <i>Stanhope-street, Hyde-park-gardens, S.W.</i>

Year of Election.		
1857		Blake,* H. Wollaston, Esq., F.R.S. 8, <i>Devonshire-place, W.</i>
1872		Blakemore, Ramsey, Esq. <i>Woodlands, Chislehurst, Kent.</i>
1861	p.	Blakeney,* William, Esq., R.N. <i>Secretary to Hydrographic-office, S.W.</i>
1876		Blakeney, Captain W. A. F.
1868		Blakiston, Matthew, Esq. 18, <i>Wilton-crescent, S.W.</i>
1857	Gr. p.	Blakiston, Captain Thomas, R.A. 18, <i>Wilton-crescent, S.W.</i>
1868	p.	Blanc, Henry, Esq., M.D., &c. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1873		Blanford,* W. T., Esq., F.G.S. <i>Geological Survey-office, Calcutta. Care of Messrs. Trübner and Co., Ludgate-hill, E.C.; and Arts Club, Hanover-square, W.</i>
1857		Blanshard, Richard, Esq. <i>Fairfield, Lymington, Hants.</i>
1839		Blewitt,* Octavian, Esq. 10, <i>John-street, Strand, W.C.</i>
1875		Blount, Edward, Esq., C.B. 28, <i>Old Burlington-street, W.; and 61, Rue de Courcelles, Paris.</i>
1866		Blow, William Wootton, Esq. <i>Oak-lodge, Ryden's-road, Walton-on-Thames.</i>
1868		Blumberg, George F., Esq. <i>Mansfield-house, Clifton-gardens, Maida-vale, W.</i>
1872		Blundell,* Charles Weld, Esq. <i>Ince, Blundell-hall, Great Crosby; and Brooks's Club, S.W.</i>
1837		Blunt,* Jos., Esq.
1863	p.	Blunt,* Wilfrid S., Esq. <i>Crabbet-park, Crawley, Sussex; and 10, James-street, Buckingham-gate.</i>
1878		Blyth, Sir Arthur, K.C.M.G. (Agent-Gen., <i>South Australia</i> ). 51, <i>Linden-gardens, Kensington, W.</i>
1871		Blyth, Henry, Esq. 53, <i>Wimpole-street, W.</i>
1868		Blyth, Philip P., Esq., J.P. 53, <i>Wimpole-street, W.</i>
1871		Bodenham,* Chas de la Barre, Esq. <i>Rotherwas, Hereford,</i>
1858		Bohn, Henry G., Esq. 18, <i>Henrietta-street, Covent-garden, W.C.; and North-end-house, Twickenham.</i>
1874		Boileau, Colonel G. W. <i>Stanfield-hall, Wymondham.</i>
1877		Bolton,* John, Esq. 13, <i>Long Acre, W.C.</i>
1861		Bompas, George Cox, Esq. 15, <i>Stanley-gardens, Kensington-park, W.</i>
1861		Bonney, Charles, Esq. <i>Adelaide, Australia.</i>
1858		Bonnor, George, Esq. 49, <i>Pall-mall, S.W.; and 2, Bayswater-terrace, Kensington-square, W.</i>
1865		Bonwick, James, Esq. 2, <i>Balmoral-terrace, Acton, W.</i>
1866		Booker, Wm. Lane, Esq. (H.B.M. Consulate, <i>San Francisco</i> ). <i>Care of Messrs. King and Co., 45, Pall-mall, S.W.</i>
1876		Boor, Geo. C., Esq. <i>Leonard-house, Green-lanes, Stoke-Newington, N.</i>
1879		Booth,* Sir Henry Gore, Bart. <i>Lissadell, Sligo.</i>
1878		Booth, Stephen, Esq. 18, <i>Blomfield-street, Upper Westbourne-terrace, W.</i>
1875		Borlase, Capt. Jno. 2, <i>Upton-villas, Hacen-green, Ealing, W.</i>
1879		Borman, Allan W., Esq. <i>Gloucester-house, Lime-grove, Uxbridge-road, W.</i>
1845		Borrer,* Dawson, Esq. <i>Altmont Ballon, Co. Carlow, Ireland.</i>
1878		Bose,* William, Esq. <i>Whitehall-yard, Woodford, Essex.</i>

Year of Election	
1875	Bourne, Geo., Esq. <i>Brisbane, Queensland. Care of Mr. John Taylor, 110, Fenchurch-street, E.C.</i>
1871	Bourne, John, Esq., C.E. 21, <i>Richmond-road, Bayswater, W.</i>
1874	Bourne, Robert, Esq., J.P. <i>Grafton-manor, Bromsgrove.</i>
1872	Bousfield, William, Esq., M.A. 33, <i>Stanhope-gardens, Queen's-gate, S.W.</i>
1860	Boustead, John, Esq. 34, <i>Craven-street, Strand, W.C.</i>
1866	Boucher,* Emanuel, Esq. 12, <i>Oxford-square, Hyde-park, W.</i>
1865	Bouverie, P. P., Esq. 32, <i>Hill-street, Berkeley-square, W.</i>
1876	Bowden, A., Esq. <i>Radcliffe Observatory, Oxford.</i>
1867	Bowell, Rev. Wm. <i>Chandos-house, Hereford.</i>
1861	Bowen,* Charles Christopher, Esq. <i>Christchurch, Canterbury, New Zealand. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1854	p. Bowen,* Sir George Ferguson, G.C.M.G., M.A. ( <i>Governor of Mauritius</i> ). <i>Care of Messrs. Cocks, Biddulph and Co., 43, Charing-cross, S.W.; and Athenæum Club, Pall-mall, S.W.</i>
1871	Bowers,* Captain Alexander. <i>Care of Messrs. Fraser and Co., Penang.</i>
1871	Bowes, John, Esq. <i>Warrington, Lancashire.</i>
1862	Bowie, John, Esq. <i>Conservative Club, S.W.</i>
1869	Bowker, James Henry, Esq. <i>Basutoland, South Africa. Care of Messrs. King and Co., Cornhill, E.C.</i>
1878	Bowles, John, Esq. <i>Landport, Portsmouth.</i>
1868	Bowly, William, Esq. <i>Cirencester.</i>
1876	Bowman, Wm., Esq., F.R.S. 5, <i>Clifford-street, W.</i>
1865	Bowring, John Charles, Esq. <i>Forest-farm, Windsor Forest.</i>
1866	Bowring, Samuel, Esq. 1, <i>Westbourne-park, W.</i>
1868	Bowser, Alfred T., Esq. <i>Sunnyside, Kenninghall-road, Upper Clapton.</i>
1845	Boyd,* Edward Lennox, Esq., F.S.A. 35, <i>Cleveland-square, Hyde-park, W.</i>
1876	Boyd, Nelson, Esq. 7, <i>Westminster-chambers, S.W.</i>
1877	Boyd, Dr. R. <i>Southall-park, Middlesex.</i>
1874	Boyd, William, Esq., M.A., F.R.S.E., F.S.A., &c. <i>Peterhead, Aberdeenshire.</i>
1876	Boyer, George Phelps, Esq. 8, <i>Warwick-crescent, Maida-hill, W.</i>
1869	Boyle, Richard Vicars, Esq., C.S.I. (Engineer in Chief to the Government Railways and Telegraph, Japan). <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1874	Boyson, Ambrose P., Esq. <i>East-hill, Wandsworth, S.W.</i>
1879	Bradfield, John Linden, Esq., M.L.A. <i>Cape Colony. Care of Messrs. A. White and Co., 17, Bloomfield-street, E.C.</i>
1876	Bradshaw,* Surg.-Major A. F. Simla, India. <i>Care of Messrs. Holt and Co., 17, Whitehall-place, S.W.</i>
1870	Bragge,* William, Esq., C.E. <i>Shirle-hill, Hamstead-road, Birmingham.</i>
1862	Braithwaite, Isaac, Esq. 27, <i>Austin Friars, E.C.</i>
1880	Braithwaite, Stephen Nelson, Esq. 73, <i>Gloucester-place, Portman-square, W.; and 25, Throgmorton-street, E.C.</i>
1863	Bramley-Moore,* John, Esq. <i>Langley-lodge, Gerrard's-cross, Bucks.</i>

Year of  
Election.

1859		Brand,* James, Esq. 109, <i>Fenchurch-street, E.C.</i>
1878		Brand,* James, Esq. <i>Bedford-hill, Balham; and 37, New Broad street, E.C.</i>
1874		Brand, Jno. Hy., Esq. President of the Orange Free State Republic, S. Africa. <i>Care of Henry Blyth, Esq., 53, Wimpole-street, W.</i>
1872		Brander, Captain William M. (24th Foot). <i>Army and Navy Club, Pall-mall, S.W.</i>
1867		Brandis, Dr. D., F.L.S. <i>Director of Forests, Calcutta. Care of W. H. Allen, Esq., 13, Waterloo-place, S.W.</i>
1876		Brandon, David, Esq. 24, <i>Berkeley-square, W.</i>
1878		Brandreth, Edward Lyall, Esq. 32, <i>Elvaston-place, Queen's-gate, S.W.</i>
1874		Brandreth,* Hy. P., Esq. <i>Standish-rectory, Wigan, Lancashire.</i>
1875		Branson, W. Powell, Esq. 23, <i>Rectory-grove, Clapham, S.W.; and 155, Fenchurch-street, E.C.</i>
1877		Brass, Emil, Esq. <i>Care of Messrs. Blatzpiel, Stamp and Heacock, 38, Knight-rider-street, Queen Victoria-street, E.C.</i>
1871		Brassey,* Thos., Esq., M.P. 24, <i>Park-lane, W.; and Normanhurst-court, Battle.</i>
1874		Bray, Joseph, Esq., C.E.
1859		Braybrooke, Philip Watson. <i>Studley, Bishop's Down Park, Tunbridge Wells.</i>
1875		Brazza, Pierre Savorgnan de. <i>Paris.</i>
1874		Brent, Algernon, Esq. <i>Audit-office, Somerset-house, W.C.</i>
1834		Breton,* Commr. Wm. Henry, R.N., F.G.S. 15, <i>Camden-crescent, Bath; and The Rectory, Charmouth, Dorset.</i>
1876		Brett, Right Hon. Sir W. Baliol, Knt. 6, <i>Ennismore-gardens, Prince's-gate, S.W.</i>
1876		Bridal, Walter Geo., Esq. 46, <i>Fentiman-road, Clapham-road, S.W.</i>
1867		Bridge, John, Esq. <i>Heatley-house, Heatley, near Warrington.</i>
1874		Bridgeman, Granville, Esq. <i>Holme-lodge, Balham-road, Upper Tooting; and Junior Conservative Club, King-street, St. James's.</i>
1876		Bridger, R. Lowther, Esq. <i>New University Club, St. James's-street, S.W.</i>
1873		Bridger, Captain W. Milton, R.N. <i>St. Stephen's Club, Westminster, S.W.</i>
1858		Bridges, Nathaniel, Esq. <i>Blackheath-park, S.E.</i>
1877		Bridges,* Commander W. B., R.N. <i>H.M.S. "Wolverine," Australia. Care of Messrs. J. W. Bridges and Sons, 5A, Warnford-court, E.C.</i>
1880		Bridgford, Major Sidney Thomas, R.M.A. <i>Army and Navy Club, Pall-mall, S.W.</i>
1852	P.	Brierly,* Oswald W., Esq. 38, <i>Amptill-square, N.W.</i>
1865		Briggs, Colonel J. P. <i>Bonjedward-house, Jedburgh.</i>
1861	P.	Bright,* Sir Charles T., F.R.A.S. 20, <i>Bolton-gardens, S.W.</i>
1868		Bright, Henry Arthur, Esq. <i>Ashfield, Knotty Ash, Liverpool.</i>
1860		Bright, James, Esq., M.D. 6, <i>Holyrood-place, Plymouth.</i>
1876		Bright-Smith, Rev. G. Aug. <i>Buscot-lodge, Maida-hill, W.</i>
1854		Brine, Colonel Frederic, R.E., K.T.S., Assoc. Inst. C.E., F.R.S. 45, <i>Victoria-street; Army and Navy, Athenaeum, and United Service Clubs, S.W.; and Garrick Club, W.C.</i>
1856	P.	Brine, Captain Lindsey, R.N. <i>Boldre-house, Lymington, Hants; and United Service Club, S.W.</i>

# List of Fellows of the

Year of Election.		
1861		Bristowe, Henry Fox, Esq. 22, <i>Old-square, Lincoln's-inn, W.C.</i>
1875		Broadmead,* Jas. B., Esq., B.A. 27, <i>Warwick-square, S.W.</i>
1861		Brodie, Walter, Esq. <i>Orsett-house, Orsett-terrace, Hyde-park, W.</i>
1861		Brodie, William, Esq. <i>Eastbourne, Sussex.</i>
1874		Brodribb, William Adams, Esq. <i>Care of Rev. W. K. Brodribb, St. Martin's Church, Brighton.</i>
1863	C.	Brodrick,* The Hon. George C. 32A, <i>Mount-street, W.</i>
1874		Brogden, James, Esq.
1876		Brooke, Commr. A. T., R.N. <i>Ashbrooke, Brookboro', Lisnaskea, Ireland.</i>
1874		Brooke, Chas., Esq. ( <i>Rajah of Sarawak</i> ).
1879		Brooke, Capt. Charles K. (15th Regiment). 3, <i>Gordon-square, W.C.</i> ; and <i>Army and Navy Club, Pall-mall, S.W.</i>
1864		Brooke,* Sir Victor A., Bart. <i>Colebrooke-park, Co. Fermanagh, Ireland.</i>
1875		Brooke, Capt. W. Saurin (Beng. Staff Corps).
1872		Brookes, Clifford J., Esq. <i>The Grange, Nightingale-lane, Clapham-common, S.W.</i>
1856		Brooking,* Marmaduke Hart, Esq. 11, <i>Montagu-place, Montagu-square, W.</i>
1877		Brooks, Joseph, Esq. <i>Survey-office, Adelaide, South Australia. Care of Messrs. Johnson and Archer, 147, Fenchurch-street, E.C.</i>
1876		Brooks, Robert Alexander, Esq. <i>Conservative Club, St. James's-street, S.W.</i>
1870		Brooks,* Wm. Cunliffe, Esq., M.P., M.A., F.S.A., &c. 5, <i>Grosvenor-square, W.</i> ; <i>Barlow-hall, near Manchester</i> ; and <i>Forest of Glen-Tanar, Aboyne, Aberdeenshire.</i>
1863		Broughall,* William, Esq. 8, <i>Great Winchester-street-buildings, E.C.</i>
1880		Brown, Charles George, Esq. <i>Orpington, Kent.</i>
1856		Brown,* Daniel, Esq.
1868		Brown, Colonel David (Madras Staff Corps). <i>India.</i>
1877		Brown, E. A., Esq. <i>Burton-on-Trent.</i>
1877	p.	Brown, Rev. George. <i>Care of the Wesleyan Missionary Society, 17, Bishopsgate-street-within, E.C.</i>
1877		Brown, Henry Rowland, Esq. 56, <i>Lincoln's-inn-fields, W.C.</i> ; and <i>Oxley-grove, Stanmore.</i>
1874		Brown, J. B. Esq. 90, <i>Cannon-street, E.C.</i> ; and <i>Bromley, Kent.</i>
1865		Brown,* James R., Esq., F.R.S.N.A., <i>Copenhagen.</i> 14, <i>Hilldrop-road, Camden-road, N.</i>
1861		Brown,* John Allen, Esq. <i>Dahlwell-lodge, Kent-gardens, Ealing, W.</i>
1867		Brown, Richard, Esq., C.E. 115, <i>Lansdowne-road, Notting-hill, W.</i>
1867	p.	Brown, Robert, Esq., M.A., PH.D., F.L.S., &c. 26, <i>Guilford-road, Albert-square, S.W.</i>
1858		Brown,* Thomas, Esq. 8, <i>Hyde-park-terrace, Hyde-park, W.</i>
1876		Brown,* Rev. Thos. E. <i>Clifton-college, Bristol.</i>
1859		Brown, William, Esq. <i>Quarry-hill-house, Tonbridge, Kent.</i>
1879		Brown, William, Esq. <i>Tollington-park-college, Holloway, N.</i>
1879		Browne, Capt. Edmund C. <i>Care of T. D. Sullivan, Esq., Royal United Service Inst., Whitehall-yard, S.W.</i>

Year of  
Election.

1864		Browne,* Captain E. P. Wade. <i>Care of Colonel Hall, Heighington, Darlington.</i>
1863		Browne, H. H., Esq. <i>Moor-close, Binfield, Bracknell.</i>
1858		Browne,* John H., Esq. <i>Lauriston, Hollington-park, St. Leonard's-on-Sea.</i>
1869		Browne, Samuel Woolcott, Esq. 58, <i>Porchester-terrace, Hyde-park, W.</i>
1874		Browne, Walter Raleigh, Esq., C.E. 38, <i>Belgrave-raod, S.W.</i>
1877		Browne, Rev. W. E. <i>West Walton, Wisbeach.</i>
1858		Browne, William J. Esq. 74, <i>Gloucester-road, South Kensington, S.W.</i>
1869		Browning, G. F., Esq. <i>The Châlet, Kingswood, Dulwich-wood-park, S.E.</i>
1852		Browning, H., Esq. 73, <i>Grosvenor-street, Grosvenor-square, W.; and Old Warden-park, Biggleswade.</i>
1856		Browning,* Thomas, Esq. 6, <i>Whitehall, S.W.</i>
1863	p.	Brunton, John, Esq., M.I.C.E., F.G.S. 13A, <i>Great George-street, S.W.</i>
1873		Brunton, R. H., Esq., F.G.S., &c. (Young's Paraffine Light Co.). <i>Bathgate, Scotland.</i>
1879		Bryans, Capt. James W. 10, <i>Ingles-park-road, Folkestone.</i>
1856		Bryant, Walter, Esq., M.D., F.R.C.S. 23A, <i>Sussex-square, Hyde-park-gardens, W.</i>
1867		Buccleuch,* His Grace the Duke of, K.G., F.R.S. <i>Dalkeith-palace, near Edinburgh; and Montagu-house, Whitehall, S.W.</i>
1874		Buchanan, R. Dunlop, Esq. 50, <i>Old Broad-street, E.C.</i>
1874		Buchanan,* Thos. Ryburn, Esq. <i>All Souls' College, Oxford.</i>
1869		Buckley, John, Esq. 16, <i>Jolimont-street, Jolimont, East Melbourne, Victoria.</i> <i>Care of Messrs. Dalgety, Du Croz, and Co., 52, Lombard-street, E.C.</i>
1876		Buckley, John, Esq. <i>The Academy, Weaver-view, Winsford, Cheshire.</i>
1863		Budd, J. Palmer, Esq. <i>Ynisdaren, near Swansea.</i>
1867		Bulger,* Lieut.-Colonel George Ernest, F.L.S., F.M.S., C.M.Z.S., &c. (late 10th Foot). <i>Care of Messrs. Wheatley and Co., 156, Leadenhall-street, E.C.</i>
1868		Bull,* William, Esq., F.L.S. <i>King's-road, Chelsea, S.W.</i>
1865		Buller, Sir Edward M., Bart., M.P. <i>Dilhorn-hall, Cheadle, Staffordshire.</i>
1869		Buller, Walter L., Esq., C.M.G., F.L.S. 7, <i>Westminster-chambers, Victoria-st., S.W.</i>
1875		Bullinger, Rev. E. Wm. <i>Walthamstow, Essex.</i>
1863		Bullock, Captain Charles J., R.N. <i>Yoroshi-house, Woolwich.</i>
1879		Bulwer, Major-General E. G., C.B. 6, <i>Montagu-square, W.</i>
1860		Bunbury,* Sir Charles James Fox, Bart., F.R.S. <i>Barton-hall, Bury St. Edmund's.</i>
1839	T. C.	Bunbury, E. H., Esq., M.A. 35, <i>St. James's-street, S.W.</i>
1863		Bundock, F., Esq. <i>Buckland-abbey, Horrabridge, S. Devon.</i>
1866		Burgess,* James, Esq., M.R.A.S. (Archæological Reporter, &c., to Government, <i>Bombay</i> ). 8, <i>Merchiston-terrace, Edinburgh.</i> <i>Care of Messrs. Trübner and Co., Ludgate-hill, E.C.</i>
1875		Burgoyne, John, Esq. <i>Woodthorpe, Stonebridge-park, Willesden.</i>
1871		Burke,* Samuel Constantine, Esq. 21, <i>Leinster-square, Bayswater, W.</i>
1864		Burn-Blyth, Robert, Esq. 5, <i>Clifton-place, Sussex-square, W.</i>
1872		Burne, Colonel Sir Owen F., K.C.S.I., C.I.E. <i>India-office, S.W.; and Heatherlea, Albany.</i>
1878		Burnett, Jas. Compton, Esq., M.D. 4, <i>Harley-place, Harley-street, W.</i>



Year of Election.		
1871		Burney, Commr. Chas., R.N., <i>Superintendent Greenwich Hospital Schools, S.E.</i>
1863		Burns, * John, Esq. <i>Castle Wemyss, by Greenock, N. B.</i>
1861		Burr, * Higford, Esq. 23, <i>Eaton-place, S. W.</i> ; and <i>Aldermaston-court, Berkshire.</i>
1857		Burstal, Captain E., R.N. 9, <i>Park-villas, Lower Norwood, S.E.</i>
1872		Burt, Charles, Esq. <i>Hill-side-house, Richmond, Surrey.</i>
1878		Burt, Frederick, Esq. 71-2, <i>Cornhill, E.C.</i> ; and <i>Woodstock, Crescent-road, Crouch End.</i>
1833		Burton, * Decimus, Esq., F.R.S. 1, <i>Gloucester-houses, Gloucester-crescent, W.</i>
1859	Ex. p.	Burton, * Capt. Richard Fras., H.B.M. Consul. <i>Trieste</i> ; and <i>Athenæum Club.</i>
1861		Bush, Rev. Robert Wheler, M.A. 29, <i>Milner-square, Islington, N.</i>
1874		Bushell, Dr. Nathaniel. <i>Bass High-school, near Bury, Lancashire.</i>
1874	p.	Bushell, S. W., Esq., M.D. <i>Care of R. Mathews, Esq., Bickley, Kent.</i>
1873		Busk, Capt. Hans, D.L., LL.D., F.R.S., Hon. D.C.L. Oxford. 21, <i>Ashley-place, S. W.</i> ; and <i>United University Club.</i>
1868		Busk, William, Esq., M.C.P., &c. 28, <i>Bessborough-gardens, S. W.</i>
1880		Bussell, Rev. James. <i>Lit. Institut, Breidenstein, Grenchen (Rt. Solothurn), Switzerland.</i>
1861		Butler, Charles, Esq. 3, <i>Connaught-place, Hyde-park, W.</i>
1867		Butler, E. Dundas, Esq. <i>Geographical Department, British Museum, W.C.</i>
1878		Butler, Frank Hedges, Esq. <i>Hollywood, Wimbledon-park, S. W.</i> ; and 14, <i>New Burlington-street, W.</i>
1878	s.	Butler, George Grey, Esq. 257, <i>Brompton-road, S. W.</i>
1878		Butler, * Lieut.-Colonel Henry Thomas. 66, <i>Prince's-gate, S. W.</i>
1860		Butler, Rev. Thomas. <i>Wilderhope-house, Shrewsbury.</i>
1871		Butler, Lient.-Colonel W. F. (69th Regiment). 3, <i>Tregunter-road, S. W.</i>
1870		Buxton, Francis W., Esq., M.P. 15, <i>Eaton-place, S. W.</i>
1869		Buxton, Henry Edmund, Esq., B.A. <i>Bank-house, Great Yarmouth, Norfolk.</i>
1873		Buxton, * John H., Esq. <i>Brewery, Spitalfields, E.C.</i>
1858	C.	Buxton, * Sir Thomas Fowell, Bart. 14, <i>Grosvenor-crescent, S. W.</i> ; and <i>Wartles, Waltham-abbey, Essex.</i>
1861		Calthorpe, The Hon. Augustus Gough. 63, <i>Rutland-gate, S. W.</i>
1855		Calthorpe, * F. H. Gough, Lord. 33, <i>Grosvenor-square, W.</i>
1854		Calvert, Frederic, Esq., Q.C. 38, <i>Upper Grosvenor-street, W.</i>
1871		Cama, * Dorabjee Pestronjee, Esq. 3 and 4, <i>Winchester-street-buildings, E.C.</i>
1861		Cameron, Donald, Esq., M.P. <i>Auchmacarry, Inverness-shire.</i>
1872		Cameron, Major Donald R., R.A., C.M.G. <i>Malta. Care of Messrs. Cox and Co., Craig's-court, S. W.</i>
1858		Cameron, Lieut.-General Sir Duncan Alexander, G.C.B.
1864	p.	Cameron, J., Esq.
1878		Cameron, Ralph Abercrombie, Esq. 3, <i>Granville-place, Blackheath</i> ; and <i>Junior Carlton Club, W.</i>

Year of  
Election.

1866

Cameron, R. W., Esq. *Clifton, Staten Island, New York. Care of Messrs. Brooks and Co., St. Peter's-chambers, Cornhill, E.C.*

1876

Gr. p.

Cameron, Commr. Verney Lovett, R.N., C.B. *Shoreham-vicarage, Sevenoaks.*

1871

Campbell,\* Allan, Esq. *Melbourne Club, Melbourne.*

1873

Campbell, C. H., Esq. *64 Cromwell-road, S.W.*

1866

C. p.

Campbell, Sir George, K.C.S.I., M.P., D.C.L. *13, Cornwall-gardens, South Kensington, S.W.; and Athenæum Club, S.W.*

1878

Campbell, Geo. W., Esq. *22, Queen's-gate-gardens, S.W.*

1844

Campbell,\* James, Esq. *Park-farm, Hendon, Middlesex; and 37, Seymour-street, W.*

1878

Campbell, James, Esq. *17, Queen's-gate, S.W.*

1857

p.

Campbell, James, Esq., Surgeon R.N. *The Grange, Chigwell-row, N.E.*

1834

Campbell,\* James, Esq., jun. *Caveley-priory, Chichester.*

1863

Campbell,\* James Duncan, Esq. *Peking. 8, Storey's-gate, St. James's-park, S.W.*

1869

Campbell, Robert, Esq., J.P. *Buscot-park, Lechlade, Gloucestershire.*

1872

Campbell, Robert, Esq. *Lednock-bank, Comrie, Perthshire.*

1872

Campbell, William, Esq. *Care of Mr. Provan, 69, St. Vincent-square, Glasgow.*

1856

Campbell-Johnston, A. R., Esq., F.R.S. *84, St. George's-square, S.W.*

1876

Campion, Frank, Esq. *The Mount, Duffield-road, Derby.*

1876

Candler, Samuel Horace, Esq., B.A., LL.B. *23, Essex-street, Strand, W.C.*

1866

Canning, Sir Samuel, C.E. *6, Horbury-road, Notting-hill, W.*

1864

Cannon,\* John Wm., Esq. *Castle-grove, Tuam.*

1877

Cantley, Nathaniel, Esq. *Botanical Gardens, Pamplemousses, Mauritius. Care of W. Coghill, Esq., Police Magistrate, Thurso, Caithness.*

1880

Capper, Robert, Esq. *Swansea-harbour, Swansea.*

1877

Cardi, Chas. Napoleon de, Esq. *78, Tower-buildings, Water-street, Liverpool.*

1873

C.

Cardwell,\* Edward H., Esq. *Hillside, West Horsley, Surrey; Oxford and Cambridge and Garrick Clubs.*

1853

Cardwell,\* Right Hon. Viscount. *74, Eaton-square, S.W.*

1863

Carew,\* R. Russell, Esq., J.P. *Carpenders-park, Watford, Herts; and Oriental Club, W.*

1873

Carey, Lieutenant H. C. (late I.N.). *Alma-road, Southport.*

1879

Carey, John James, Esq. *Indore, Central India. Care of Messrs. H. S. King and Co., Cornhill, E.C.*

1869

Carey, Rev. Tupper. *Fifield, Bavant, Salisbury; and 15, Hyde-park-gardens, W.*

1872

Carfrae, John, Esq. *28, Norfolk-road, St. John's-wood, N.W.; and Junior Conservative Club, King-street, St. James's.*

1862

Cargill, John, Esq. *Dunedin, Otago, New Zealand. Care of Messrs. Cargill, Joachim and Co., 1, Great Winchester-street, E.C.*

1863

Cargill,\* Wm. W., Esq. *Lancaster-lodge, Campden-house-road, W.*

1873

Carillon,\* John Wilson, Esq., F.S.A., F.S.S., &c. *Wormhill, Buxton.*

1858

Carlingford, Right Hon. Lord. *7, Carlton-gardens, S.W.*

1876

Carlisle, A. D., Esq. *Haileybury-college, Hertford.*

Year of Election.		
1864		Carmichael,* Capt. L. M., M.A. (5th Lancers). <i>Athenæum Club, Pall-mall, S.W.; and 17, West Cromwell-road, S.W.</i>
1865		Carnegie,* David, Esq. <i>Eastbury, by Watford, Herts.</i>
1863		Carnegie, Commander the Hon. J., R.N. 26, <i>Pall-mall, S.W.</i>
1876		Carr,* Wm. Ward, Esq., M.D. 6, <i>Lee-terrace, Lee, S.E.</i>
1879		Carr-Gomm, F. Culling, Esq. 10, <i>New-street, Spring-gardens, S.W.</i>
1861		Carter, Lieut.-Colonel Hugh Bonham-(Coldstream Guards). <i>Guards' Club, S.W.; and 51, Victoria-street, S.W.</i>
1868		Carter, Major Thomas Tupper, R.E. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall.</i>
1873		Carter, Theodore, Esq. <i>Mapperley-house, Burnt-ash-hill, Lee, S.E.</i>
1857		Cartwright, Col. Henry (Grenadier Guards), M.P. <i>Eydon-hall, Banbury.</i>
1874		Cartwright, William, Esq. <i>Care of Office of Chinese Customs, 8, Storey's-gate, St. James's-park, S.W.</i>
1860		Carver,* Rev. Alfred J., D.D., Master of Dulwich College. <i>Dulwich, S.E.</i>
1869		Casberd-Boteler, Commr. W. J., R.N. <i>The Elms, Taplow; and Naval and Military Club, Piccadilly, W.</i>
1858		Casella, Louis P., Esq. 147, <i>Holborn-bars, E.C.; and South-grove, Highgate, N.</i>
1875		Cassels, Andrew, Esq. (Member of Council of India). 51, <i>Cleveland-square, Hyde-park, W.</i>
1874		Cassiani, Chas. Joseph, Esq. 12, <i>George-street, Portman-square, W.</i>
1877		Cates, Arthur, Esq. 7, <i>Whitehall-yard, S.W.</i>
1873		Cathcart, Major Andrew. 16, <i>Grosvenor-street, W.</i>
1872		Caton, R. Redmond, Esq., F.S.A. <i>Union Club; and Binbrook-house, Market-Rasen, Lincolnshire.</i>
1872		Cattley, Edward, Esq. 98, <i>Dover-road, Folkestone, Kent; and St. Petersburg.</i>
1879		Caudwell,* J., Esq. <i>Spencer-park, Wandsworth-common, S.W.</i>
1860		Cave, Amos, Esq. <i>Grove-house, Cromwell-road, Brixton-rise, Surrey.</i>
1876		Cave, Colonel Edward. <i>East India United Service Club, 14, St. James's-square, S.W.</i>
1857		Cave, Captain Laurence Trent. 13, <i>Lowndes-square, S.W.</i>
1874		Cave-Browne, Rev. J. <i>Detling-vicarage, Maidstone.</i>
1869	p.	Cayley, Dr. Henry. 3, <i>All Saints'-road, Clifton, Bristol.</i>
1873		Chadwick, Jesse, Esq. <i>London-road, Derby.</i>
1874		Chadwick, Jno. O., Esq. 46, <i>Bolton-road, St. John's-wood, N.W.</i>
1863		Challis, John Henry, Esq. <i>Reform Club, S.W.</i>
1871		Chalmer,* Capt. Reginald (60th Royal Rifles). <i>Peshawur, East Indies.</i>
1880		Chamberlaine-Bey, Charles de T. 31, <i>St. Charles's-square, N. Kensington, W.</i>
1874		Champaign, Major J. U. Bateman, R.E. <i>Chisholm-lodge, Queen's-road, Richmond.</i>
1858		Champion, John Francis, Esq. <i>High-street, Shrewsbury.</i>
1876		Champney, Chas. E., Esq. <i>Bank Field, Halifax.</i>
1866	Gr. p.	Chandless,* William, Esq. 5, <i>Portman-street, Oxford-street, W.</i>
1875		Chapelle, Count de la. 1, <i>Rue Godat de Mauroi, Paris.</i>

Year of Election.		
1870		Chapman, Lieut.-Col. E. F., R.A. <i>Fairholme, Wimbledon, S.W.</i>
1863		Chapman,* Spencer, Esq. <i>Rochampton, S.W.</i>
1880		Charlemont, Right Hon. The Earl of, K.P. 1, <i>Mansfield-street, W.</i>
1861		Charnock, Richard Stephen, Esq., PH.D., F.S.A. <i>Junior Garrick Club, Adelphi-terrace, W.C.</i>
1875		Chater, Geo., junr., Esq. 41, <i>Porchester-square, Hyde-park, W.</i>
1872		Chatwood, Samuel, Esq. 5, <i>Wentworth-place, Bolton.</i>
1876		Chauvin, George von, Esq. 100, <i>Gresham-house, Old Broad-street, E.C.</i>
1864	p.	Cheadle, Walter B., Esq., B.A., M.D. Camb. 2, <i>Hyde-park-place, Cumberland-gate, W.</i>
1873		Cheetham, Samuel, Esq. 11, <i>Rumford-place, Liverpool.</i>
1855		Cheshire, Edward, Esq. 3, <i>Vanbrugh-park, Blackheath, S.E.; and Conservative Club, S.W.</i>
1858		Chetwode, Augustus L., Esq. 3, <i>Charles-street, Lowndes-square, S.W.; and Chilton-house, Thame, Oxfordshire.</i>
1876		Cheyne, Captain Jno. P., R.N. 1, <i>Westgate-terrace, W. Brompton, S.W.</i>
1870		Chichester, Sir Bruce, Bart. <i>Arlington-court, Barnstaple.</i>
1858		Childers, Right Hon. Hugh C. E., M.P. 17, <i>Prince's-gardens, S.W.</i>
1856		Childers, John Walbanke, Esq. <i>Cantley-hall, near Doncaster.</i>
1878		Childs, Capt. Geo. Coulson (Acting Col. Secy., Accra). 11, <i>Finsbury-place South, E.C.</i>
1857	p.	Chimmo,* Captain William, R.N. <i>Westdowne, Weymouth.</i>
1869		Chinnock, Frederick George, Esq. 86, <i>Cornwall-gardens, Queen's-gate, S.W.</i>
1880		Chirnside, Andrew, Esq. <i>Care of Messrs. Dalgety, Du Croz and Co., 52, Lombard-street, E.C.</i>
1874		Cholmley,* Harry Walter, Esq. <i>Howsham, near York.</i>
1877		Christie, Edward Richard, Esq.
1872		Christie, James Alexander, Esq. <i>Plymouth.</i>
1873		Christie, T. Beath, Esq., M.D. <i>Ealing.</i>
1880		Christy,* Thomas, Esq. <i>Malvern-house, Sydenham, S.E.</i>
1878		Church, Capt. Edw. John, R.N. <i>Royal Naval College, Greenwich.</i>
1871		Church, Colonel Geo. Earl. <i>Care of W. W. Wynne, Esq., 40, Chancery-lane, E.C.</i>
1830		Church,* W. H., Esq.
1849	C.	Churchill, Lord Alfred Spencer. 16, <i>Butland-gate, S.W.</i>
1856		Churchill, Charles, Esq. <i>Weybridge-park, Surrey.</i>
1870		Clapton, Edward, Esq., M.D., &c. <i>St. Thomas's-street, Southwark, S.E.</i>
1863		Clark, Lieut. Alex. J. 33, <i>Springfield-road, St. John's-wood, N.W.; and 14, St. James's-square, S.W.</i>
1870		Clark, Charles, Esq. 20, <i>Belmont-park, Lee, Kent, S.E.</i>
1872		Clark, George Thomas, Esq. <i>Dowlais-house, Dowlais.</i>
1873		Clark, Sir John, Bart. <i>Tillypronie, Turland, Aberdeenshire.</i>
1868		Clark, John Gilchrist, Esq. <i>Speddock, Dumfries, Dumfriesshire.</i>
1862		Clark, J. Latimer, Esq. 5, <i>Westminster-chambers, Victoria-street, S.W.; and Beechmont, Dulwich, S.E.</i>

Year of  
Election.

1879		Clark, Mateo, Esq. <i>Care of Francisco Torrome, Esq., 4, Jeffreys-square, St. Mary-axe, E.C.</i>
1874		Clark,* Mathew E., Esq. 18, <i>Granville-place, Portman-square, W.</i>
1870		Clark, Robert, Esq. 46, <i>Chepstow-villas, Bayswater, W.</i>
1878		Clark, Stephen, Esq. 1, <i>Lavender-villa, Wood-street, Barnet.</i>
1868	1	Clark, William, Esq.
1865		Clark, W. H., Esq. 6, <i>Leinster-terrace, Hyde-park, W.</i>
1874		Clark-Kennedy,* Capt. Alexander W. M., F.Z.S. (late Coldstream Guards). <i>Guards' Club, Pall-mall, S.W.</i>
1875		Clarke, Archibald Hy., Esq. <i>South-hill, Paignton, Devon.</i>
1859		Clarke, Col. Sir A., R.E., K.C.M.G. <i>Army and Navy Club, S.W.</i>
1874	p.	Clarke, Major F. C. H., R.A., C.M.G. <i>Adair-house, St. James's-square, S.W.</i>
1872		Clarke, Joseph, Esq. <i>North-hill-villa, Highgate, N.</i>
1879		Clauson, Charles, Esq. 106, <i>Fenchurch-street, E.C.</i>
1863		Clayton, Captain John W. (late 15th Hussars). 14, <i>Portman-square, W.</i>
1866		Cleghorn,* Hugh, Esq., M.D. <i>Strawthby, St. Andrew's.</i>
1871	p.	Cleghorn, John, Esq., M.S.S., M.S.A., &c. 3, <i>Spring-gardens, S.W.</i>
1879		Clement, Major Reynold Alleyne. <i>Datchet, Bucks.</i>
1863		Clements, Rev. H. G. <i>Vicarage, Sidmouth; and United University Club, S.W.</i>
1870		Clements, Robert George, Esq. 97, <i>Victoria-park-road, E.</i>
1860	p.	Clerk, Captain Claude. <i>Hyderabad, E. Indies.</i>
1858		Clermont, Thomas, Lord. 35, <i>Hill-street, Berkeley-square, W.; and Ravensdale-park, Newry.</i>
1845		Cleveland,* His Grace the Duke of. <i>Cleveland-house, 17, St. James's-square, S.W.</i>
1861		Clifford, Sir Charles. <i>Hatherton-hall, Cannock, Staffordshire.</i>
1858		Clifford, Charles Cavendish, Esq., M.P. <i>House of Lords, S.W.</i>
1871		Clifford, Henry, Esq., C.E. 1, <i>Lansdown-place, Blackheath, S.E.</i>
1866		Clinton, Lord Edward. <i>Army and Navy Club, S.W.</i>
1875		Clirehugh, W. P., Esq. 14, <i>Ladbroke-terrace, Notting-hill.</i>
1879		Clive, Colonel Edward H. (Grenadier Guards). 15, <i>Ennismore-gardens, Prince's-gate, S.W.</i>
1863		Clowes, E., Esq. <i>Salisbury-square, Fleet-street, E.C.</i>
1874		Clowes, Capt. Frederic (30th Regiment). 51, <i>Gloucester-terrace, Hyde-park, W.</i>
1854		Clowes, George, Esq. <i>Duke-street, Stamford-street, S.E.; Charing-cross, S.W.; and Surbiton, Surrey.</i>
1854		Clowes, William, Esq. 51, <i>Gloucester-terrace, Hyde-park, W.</i>
1861		Clowes, William Charles Knight, Esq., M.A. <i>Duke-street, Stamford-street, S.E.; and Surbiton, Surrey.</i>
1874		Coard, Philip Aldridge, Esq. 13, <i>St. Mark's-square, Sandringham-road, West Hackney, E.</i>
1877		Coate, James, Esq. 41 and 42, <i>Lisle-street, Leicester-square, W.C.; and Chard, Somersetshire.</i>
1875		Coates, Edmund, Esq. 8, <i>Baker-street, Portman-square, W.</i>

Year of  
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1877		Coates, Walter S., Esq. 2, <i>Malvern-villas, Belgrave-road, Bath.</i>
1875		Cobb, Jas. Francis, Esq. <i>The Brake, Torquay, Devon.</i>
1852		Cobbold, John Chevalier, Esq. <i>Athenæum Club, S. W.; and Ipswich, Suffolk.</i>
1859		Cochrane, Rear-Admiral the Hon. A., C.B. <i>Junior United Service Club, S. W.</i>
1873		Cochrane,* Kenneth, Esq. <i>Elmbank, Galashiels, N. B.</i>
1868		Cock, Edward, Esq. <i>Kingston-on-Thames.</i>
1869		Cockburn,* Major James George (6th Regiment). <i>Bracondale, Norwich</i>
1862		Cockerton, Richard, Esq. <i>Cornwall-gardens, South Kensington, S. W.</i>
1862		Cockle,* Captain George. 9, <i>Bolton-gardens, South Kensington, S. W.</i>
1876		Cocks,* Alf. Heneage, Esq. <i>Thames Bank, Great Marlow, Bucks.</i>
1859		Cocks, Colonel C. Lygon (Coldstream Guards). <i>Trevelbyn-Vean, Lisheard, Cornwall.</i>
1865		Cocks, Major Octavius Yorke. 86, <i>Park-street, Grosvenor-square, W.</i>
1841	C.	Cocks,* Reginald Thistlethwayte, Esq. 43, <i>Charing-cross, S. W.; and 29, Stanhope-gardens, South Kensington, S. W.</i>
1876		Cocks,* Thos. S. Vernon, Esq. 43, <i>Charing-cross, S. W.</i>
1871		Cockshott,* Arthur, Esq., M.A. <i>Eton College.</i>
1873		Codrington, General Sir William, G.C.B. 110, <i>Eaton-square, S. W.</i>
1872		Coe,* Rev. C. C. <i>Highfield, Bolton-le-Moors.</i>
1857		Coghlan, Edward, Esq. <i>Training-institution, Gray's-inn-road, W.C.</i>
1861		Coghlan, J., Esq. (Engr.-in-Chief to the Government, <i>Buenos Ayres</i> ). <i>Care of H. C. Forde, Esq., 6, Duke-street, Adelphi, W.C.</i>
1876		Coghlan,* Staff-Commr. Jas. E., R.N. <i>Care of Hydrographic-office, Admiralty, S. W.; and East India United Service Club, St. James's-square, S. W.</i>
1865		Colchester, Reginald Charles Edward, Lord. <i>Kidbrooke, East Grinstead.</i>
1879		Cole, Alfred Clayton, Esq. 64, <i>Portland-place, W.</i>
1875		Cole, Geo. Ralph Fitz-Roy, Esq. <i>Queen Anne's-mansion, Westminster, S. W.; and Wanderers' and South American Clubs, S. W.</i>
1868		Cole, William H., Esq. 64, <i>Portland-place, W.</i>
1876		Cole, Wm. Hammond, Esq. <i>Great Plumstead, near Norwich, Norfolk.</i>
1867		Colebrook, John, Esq. 17, <i>Walton-place, Chelsea, S. W.</i>
1841		Colebrooke,* Sir Thomas Edward, Bart., M.P., F.R.A.S. 37, <i>South-street, Park-lane, W.</i>
1854		Coleman, Everard Home, Esq., F.R.A.S. <i>Registry and Record Office, 82, Basinghall-street, E.C.</i>
1848		Coles, Charles, Esq. 86, <i>Great Tower-street, E.C.</i>
1876		Coles, James, Esq. 26, <i>Malvern-road, Beeston-hill, Leeds.</i>
1873		Coles, Jno., Esq. <i>Mitcham, Surrey.</i>
1835		Collett,* William Rickford, Esq. <i>Carlton Club, S. W.</i>
1872		Collingwood, Lieut. W. <i>India-office, S. W.</i>
1878		Collins, Wm., Esq. 3, <i>Park-terrace East, Glasgow.</i>
1866	p.	Collinson, John, Esq., C.E. 13, <i>Palace-gate, W.</i>
1855	Gr. C. p.	Collinson, Vice-Admiral Sir Richard, K.C.B. <i>Haven-lodge, Ealing, W.; and United Service Club, S. W.</i>

Year of Election.		
1871		Collis,* Capt. Gustavus W. Berry (6th Royal Regiment). <i>Barton-terrace, Dawlish, Devon.</i>
1878		Colomb, Captain J. C. R. <i>Droumquinna, Kenmare, Co. Kerry; and Junior United Service Club, S.W.</i>
1862		Colquhoun, Sir Patrick M. de, Q.C., LL.D. 2, <i>King's-Bench-walk, Temple, E.C.</i>
1869	P.	Colvill, Surg.-Major William H., Ind. Army. <i>Baghdad, Turkish Arabia. Care of Messrs. Gellatly, Hankey and Co., 51, Pall-mall, S.W.</i>
1861		Colville,* Right Hon. Lord. 42, <i>Eaton-place, S.W.</i>
1865		Colvin, Binny J., Esq. 17, <i>Elvaston-place, Queen's-gate, S.W.</i>
1868		Colvin, Captain W. B. (Royal Fusiliers).
1868		Combe, Lieut. B. A.
1871		Comber, Colonel A. K. (Dep.-Commissioner of Assam, Goalpara). <i>Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.</i>
1879	P.	Comber,* Rev. T. J. <i>Care of A. H. Baynes, Esq., 19, Castle-street, Holborn, E.C.</i>
1864		Commerell, Admiral Sir J. E., V.C., K.C.B.
1876		Congreve, Chas. R., Esq. <i>Care of R. J. Congreve, Esq., Carlinwark, Castle-Douglas, N. B.</i>
1876		Conlan, Geo. Nugent, Esq. <i>Tivoli-house, Kingstown, Co. Dublin.</i>
1878		Coode, Sir John, Knt., C.E. 35, <i>Norfolk-square, Hyde-park, W.</i>
1872		Cook,* F. L., Esq. 24, <i>Hyde-park-gardens, W.</i>
1868	P.	Cook, H., Esq., M.D., &c.
1859		Cooke, Lieut.-Col. A. C., B.E. <i>Ordnance-house, Southampton.</i>
1856		Cooke, John George, Esq.
1852		Cooke, Robt. F., Esq. 50, <i>Albemarle-street, W.</i>
1860		Cooke, William Henry, Esq., Q.C. 42, <i>Wimpole-street, W.</i>
1874		Cooke, Capt. W. S. (22nd Regiment). <i>Malta.</i>
1872		Cookson,* F., Esq. 35, <i>Grand Parade, Brighton.</i>
1830	P.	Cooley, William Desborough, Esq. 55, <i>Crowndale-road, Camden-town, N.W.</i>
1876		Cooling, Edwin, Esq. <i>Mile Ash, Derby.</i>
1875		Coombe, Edward, Esq. 25, <i>The Terrace, Greenhithe, Kent.</i>
1872		Cooper, Alfred, Esq. 9, <i>Henrietta-street, Cavendish-square, W.</i>
1872		Cooper, Commr. B. J., R.N.
1877		Cooper, Charles E., Esq. <i>Observatory-house, Kingsdown, Bristol.</i>
1862		Cooper, Sir Daniel. 6, <i>De Vere-gardens, Kensington-palace, W.</i>
1856		Cooper, Lieut.-Col. Edward H. (Grenadier Guards). 42, <i>Portman-square, W.</i>
1860		Cooper, Lieut.-Col. Joshua H. (7th Fusiliers). <i>Dunboden, Mullingar.</i>
1878		Cooper, Percy H., Esq. <i>Bullcell-hall, Nottingham.</i>
1874		Cooper, William White, Esq. 19, <i>Berkeley-square, W.</i>
1876		Coote, Algernon C. P., Esq., M.A. <i>Laurel-lodge, Barnet.</i>
1857		Coote,* Vice-Admiral Robert, C.B. " <i>Shales</i> ," <i>Bitterne, Southampton.</i>
1878		Copland-Crawford, Fitzgerald Hamilton, Esq. <i>Sudbury-lodge, Harrow.</i>
1874		Copland-Crawford, General R. F., R.A., F.G.S. <i>Sudbury-lodge, Harrow, Middlesex.</i>

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- 1853 Copley, Sir Joseph William, Bart. *Travellers' Club, Pall-mall, S. W.*
- 1868 Cork, Nathaniel, Esq. *Grennel-house, Sutton, Surrey.*
- 1868 Corner, William Mead, Esq. "*Sunnyside*," 16, *Longton-grove, Upper Sydenham.*
- 1860 Cornwell, James, Esq., PH.D. *Purbrook, Crescent-wood-road, Sydenham-hill, S.E.*
- 1877 Corscaden, John F., Esq. 24, *Holland-park, W.*
- 1868 Cory, Frederic C., Esq., M.D. *Portland-villa, Buckhurst-hill, Essex; and Nassau-place, Commercial-road, E.*
- 1873 Cosson, Capt. Emilius Albert de. *Pycroft-house, Chertsey, Surrey.*
- 1874 Cosson, \* Baron de. *Pycroft-house, Chertsey, Surrey; and 38, Rue St. Dominique, St. Germain, Paris.*
- 1869 Coster, Guillaume F., Esq. 11, *Park-crescent, Regent's-park, N. W.*
- 1853 Cosway, \* William Halliday, Esq.
- 1875 Cotesworth, Wm., Esq. *Cowdenknowes, Roxburghshire, N. B.*
- 1876 Cotterill, Rev. G. E. 5, *Arlington-villas, Brighton.*
- 1875 p. Cotterill, H. B., Esq., B.A. 10, *Schweizer-strasse, Dresden.*
- 1856 C. Cottesloe, Right Hon. Lord. 20, *Eaton-place, S. W.; and Swanbourne, Winslow, Buckinghamshire.*
- 1873 Cottrill, Robert Alfred, Esq. *Spelthorne-grove, Sunbury, Middlesex.*
- 1877 Couch, Right Hon. Sir Richard, Knt. 25, *Linden-gardens, Bayswater-road, W.*
- 1873 Courtenay, J. Irving, Esq. 3, *Plowden-buildings, Temple, E. C.*
- 1874 Courtney, \* Henry Nicholas, Esq., B.A. 2, *Little Stanhope-street, Mayfair, W.; and National Club, Whitehall-gardens, S. W.*
- 1875 Covington, Rev. W., Vicar of St. Luke's. *The Vicarage, Brompton, S. W.*
- 1875 Coward, Dr. John W. S. *Care of Messrs. Hollams, Son and Coward, Mincing-lane, E. C.*
- 1862 Coward, Wilham, Esq. 41, *Pen-y-wern-road, S. Kensington, S. W.*
- 1857 Cowell, \* Lieut.-Col. Sir J. C., R.E., K.C.B. *Buckingham-palace, S. W.*
- 1854 Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square, W.*
- 1871 Cowper, Henry Aug. (Consul-General at Cuba). *Care of Messrs. Woodhead and Co., 44, Charing-cross, S. W.*
- 1879 Cox, Major-General John William, C.B. *Huntley-lodge, Queen's-place, Southsea.*
- 1874 Coxon, Samuel Bailey, Esq., F.G.S. *Usworth-hall, Durham.*
- 1865 Coysh, John S., Esq. 21, *Linden gardens, W.*
- 1870 Cracroft, \* Bernard, Esq., M.A. Trin. Coll. Camb. *Oxford and Cambridge Club, S. W.; and 1, Stanford-row, South Kensington, S. W.*
- 1875 Cragoe, \* Thos. Adolphus, Esq. *Woodbury-villa, Truro.*
- 1867 Crane, Leonard, Esq., M.D. 7, *Albemarle-street, W.*
- 1873 Craufurd, George Ponsonby, Esq. *Buenos Ayres; and Travellers' Club, S. W.*
- 1857 Cranford, Lieut.-General James Robertson (Grenadier Guards) *Travellers' Club, S. W.; and 36, Prince's-gardens, S. W.*
- 1875 Craven, Alfred, Esq. *Brookfield-house, Folkestone.*
- 1848 C. Crawford, Robert Wigram, Esq. 11, *Warwick-square, S. W.*
- 1879 Crawford, Major-General S. Wylie. *Union Club, New York.*



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- 1876 Crawley, Wm. John Chetwode, Esq., LL.B., F.G.S., &c. 3, *Ely-place, Dublin.*
- 1873 Creswell, Alf. Aug., Esq. 12, *Regent's-park-road, N.W.*
- 1861 Creswell, Rev. Samuel Francis, D.D., F.R.A.S. *Northrepps-rectory, Norwich.*
- 1880 Crewe, Hugo Harpur, Esq. *Calke-abbey, Derbyshire.*
- 1859 Creyke,\* Captain Richard Boynton, R.N. *Gristhorpe-hall, Filey, Yorkshire.*
- 1877 Crispe, James, Esq. *Leatherhead.*
- 1856 Croker, T. F. Dillon, Esq. 19, *Pelham-place, Brompton, S.W.*
- 1864 Croll, Col. A. A., C.E., F.G.S., Netherlands. *Granard-lodge, Roehampton.*
- 1868 Croll, Alex., Esq. *Mavis-bank, Grange-road, Upper Norwood.*
- 1860 Croskey,\* J. Rodney, Esq. 9, *Portsmouth-road, Maida-vale, W.*
- 1877 Crosse, Captain Arthur T. (52nd Regiment). *Aldershot.*
- 1862 Crossman, James Hiscutt, Esq. 31, *Curzon-street, Mayfair, W.*
- 1875 Crossman, Lieut.-Colonel W., R.E., C.M.G. 30, *Harcourt-terrace, Redcliffe-square, S.W.*
- 1879 Crothers, Wm. Edmund, Esq. 47, *Victoria-street, Belfast; and Botanic-avenue, Belfast.*
- 1863 Crowder,\* Thos. Mosley, Esq., M.A. *Corpus Christi College, Oxford.*
- 1874 Crowe, Francis, Esq., LL.D. 22, *Westbourne-park-road, W.*
- 1872 Cruikshank, Donald, Esq. *Beaconsfield Club, Pall-mall, S.W.*
- 1859 Cull, Richard, Esq., F.S.A. 12, *Tavistock-street, Bedford-square, W.C.*
- 1874 Cumming, Chas. Lennox B., Esq. (Madras Civil Service). *Care of Messrs. Forbes, Forbes and Co., 9, King William-street, E.C.*
- 1857 Cumming, William Fullarton, Esq., M.D. *Athenæum Club, S.W.; and Kinellan, Edinburgh.*
- 1877 Cunha, J. Gerson da, Esq., M.D. *Royal Asiatic Society, Bombay.*
- 1860 Cunliffe, Roger, Esq. 10, *Queen's-gate, S.W.*
- 1853 • Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house, W.C.; and Harrow.*
- 1862 Cunynghame,\* Gen. Sir A. T., G.C.B. 10, *Eaton-terrace, Eaton-square, S.W.*
- 1872 Curling, Rev. J. Jas. *Care of Sir Bryan Robinson, 9, Gordon-place, Campden-hill, Kensington, W.*
- 1877 Currie, Donald, Esq., C.M.G., M.P. 13, *Hyde-park-place, W.*
- 1877 Currie, Raikes, Esq. *Minley, Hampshire.*
- 1843 Cursetjee,\* Manockjee, Esq., F.R.S.N.A. *Villa-Byculla, Bombay.*
- 1839 Curtis,\* Timothy, Esq.
- 1872 C. Cust, Robt. Needham, Esq. 64, *St. George's-square, S.W.*
- 1867 Cuttance, John Fras. J., Esq. *Cleveland-house, Greville-road, Kilburn, N.W.*
- 1872 Czarnikow, Caesar, Esq. 29, *Mincing-lane, E.C.*

Year of Election.		
1874		Dadson, Arthur Jas., Esq.
1879		Dale, Langham, Esq. <i>Dept. of Public Education, Cape Town. Care of Messrs. King and Co., Cornhill, E.C.</i>
1863		Dalgety,* Fred. G., Esq. 16, <i>Hyde-park-terrace, W.</i>
1870		Dallas, Sir Geo. E., Bart. <i>Foreign-office, Downing-street, S.W.</i>
1865	p.	D'Almeida, W. B., Esq. 19, <i>Green-park, Bath.</i>
1880		Dalton, Charles, Esq. <i>Percy-house, Twickenham-park, S.W.</i>
1857		Dalton, D. Foster Grant, Esq. <i>Shanks-house, near Wincanton, Somerset.</i>
1879		Dalton, Major-General Edw. T., C.S.I. <i>Queen Anne's-mansions, S.W.</i>
1873		Daly, Chief Justice Chas. P., LL.D. (President of the American Geographical Society, New York). 84, <i>Clinton-place, New York.</i>
1859	p.	Dalyell, Sir Robert Alexander Osborn, Bart. <i>Travellers' Club, Pall-mall, S.W.</i>
1871		Daniell,* Colonel E. Staines. <i>Hamilton-house, Odiham, Hampshire; and East India United Service Club, 14, St. James's-square, S.W.</i>
1878		Danson, William, Esq. 2, <i>Eton-road, Haverstock-hill, N.W.</i>
1877		Darbishire, Godfrey, Esq. <i>Victoria-park, Manchester.</i>
1874		Darroch, Geo. Edw., Esq. 40, <i>Stanhope-gardens, S.W.; and Oxford and Cambridge Club, Pall-mall, S.W.</i>
1838,	C. p.	Darwin,* Charles, Esq., M.A., F.R.S. <i>Down, Beckenham, Kent.</i>
1877		Davenport, Samuel, Esq. <i>Care of H. D. Davenport, Esq., The Grange, Ealing, W.; and Beaumont, near Adelaide, S.A.</i>
1879		Davies, Rev. Edw. Aug. <i>Shady-tree-house, Middleton, Lancashire.</i>
1863		Davies, Sir R. H., K.C.S.I. <i>Care of Messrs. Twining, 215, Strand, W.C.</i>
1873		Davies, Rev. R. V. Faithfull. <i>Trinity-college, Eastbourne.</i>
1869		Davies,* Robert E., Esq., J.P. <i>Cosham-house, East Cosham, Hants.</i>
1873		Davies, W. Hy. Esq. 51, <i>Tregunter-road, South Kensington, S.W.</i>
1879		Davis, Rev. Charles. 10, <i>Cromwell-street, Gloucester.</i>
1866		Davis, Edmund F., Esq.
1866		Davis, Frederick E., Esq. 20, <i>Blandford-square, N.W.</i>
1875		Davis,* Commr. Hugh, R.N. <i>Army and Navy Club, Pall-mall.</i>
1877		Davis, Israel, Esq., M.A. 6, <i>King's-Bench-walk, Temple, E.C.</i>
1846	p.	Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. <i>Athenæum Club, S.W.; and Hollywood, near Bristol.</i>
1874		Dawes, Edwyn, Esq. <i>Heathfield-lodge, Surbiton.</i>
1875		Dawney,* The Hon. Guy C. 8, <i>Belgrave-square, S.W.; and Bookham-grove, Leatherhead.</i>
1840		Dawney,* The Hon. Payan. <i>Beningborough-hall, Newton-upon-Ouse, Yorkshire.</i>
1879		Dawson, Lieut. Llewellyn S., R.N. <i>Hydrographic-office, Admiralty, S.W.</i>
1877		Day, Frederick, Esq. <i>South Molton, North Devon.</i>
1875		Daymond, Rev. Charles, M.A., Principal of St. Peter's College, <i>Peterborough.</i>
1877		Dean, F. J., Esq. <i>Sutton-place, Sutton-at-Hone, near Dartford.</i>

Year of Election.		
1879		Deane, Lieut.-Colonel Bonar. 81, <i>Denbigh-street, Belgrave-road, S.W.</i>
1878		Deane, John Richard, Esq. <i>Care of Messrs. H. S. King and Co., Pall-mall, S.W.</i>
1865		Debary, Rev. Thomas, M.A. <i>Athenæum Club, Pall-mall, S.W.</i>
1866		Debenham, William, Esq. 41, <i>Grove-end-road, St. John's-wood, N.W.</i>
1874		De Blaquièrre, Capt. Lord, R.N. <i>Scientific Club, 7, Savile-row, W.; and Springfield, Crawley, Sussex.</i>
1878		Dé Bourgho, Thomas J., Esq. 161, <i>Brecknock-road, Tufnell-park, N.W.</i>
1876		De Crespigny, Aug. C., Esq. <i>London and County Club, Langham-place, W.</i>
1856	P.	De Crespigny, Lieut. C., R.N. <i>Care of Messrs. King and Co., 65, Cornhill, E.C.</i>
1876		Dekeyser, * P., Esq. <i>Chatham-house, Groce-road, Clapham-park.</i>
1865		De Laski, * A., Esq. 2, <i>Adelaide-crescent, Brighton.</i>
1869		De Leon, Dr. Hananel. 26, <i>Redcliffe-gardens, West Brompton, S.W.</i>
1879		Delmege, Anthony A., Esq. 17, <i>St. Helen's-place, E.C.</i>
1862	P.	Deaham, Vice-Adm. Sir Henry Mangles, F.R.S. 21, <i>Carlton-road, Maida-vale, W.</i>
1860		Denison, Alfred, Esq. 6, <i>Albemarle-street, W.</i>
1876		Denman, Hon. Geo. 11, <i>Palace-gate, Kensington, W.</i>
1875		Denny, * Edward Maynard, Esq. 55, <i>Manchester-street, W.</i>
1876		Denny, Thomas Anthony, Esq. 7, <i>Connaught-place, W.; and Budingwood, Horsham.</i>
1872		Dent, * Alfred, Esq. 29, <i>Chesham-street, S.W.</i>
1874		Dent, Clinton T., Esq. 29, <i>Chesham-street, S.W.</i>
1872		Dent, * Edward, Esq. <i>Fernacres, Fulmer, near Slough, Bucks.</i>
1871		Dentry, James, Esq. <i>The College, Margate.</i>
1853	C.	Derby, * Right Hon. Edward Henry, Earl of, P.C., LL.D., D.C.L. 23, <i>St. James's-square, S.W.; and Knowsley-park, Prescott, Lancashire.</i>
1877	•	Derry, Frederick, Esq. 31, <i>Upper Hockley-street, Birmingham.</i>
1875		De Ricci, Hon. Jas. H., Chief Justice and President Legislative Council, <i>Bahamas. Care of the Colonial Office, S.W.</i>
1875		De Salis, Wm. Fane, Esq. <i>Dawley-court, Uxbridge.</i>
1872		Desmond, Rev. H. M. Egan. 31, <i>Belsize-park, N.W.; and London and Westminster Bank, 1, St. James's-square.</i>
1874		Devas, Thomas, Esq. <i>Mount Ararat, Wimbledon.</i>
1874		Devereux, W. Cope, Esq., R.N. <i>The Anchorage, Chislehurst.</i>
1877		De Vitre, Rev. George, M.A. <i>Keep Hatch, Wokingham, Berks.</i>
1837		Devonshire, * His Grace the Duke of, K.G., LL.D., D.C.L., F.R.S. <i>Devonshire-house, Piccadilly, W.; and Hardwicke-hall, Derbyshire.</i>
1853		De Wesselow, Lieut. Fras. G. Simpkinson. 67, <i>Victoria-street, S.W.</i>
1877		Dewdney, George, Esq., B.A. <i>Belle-vue, Chepstow.</i>
1872		Dhuleep-Singh, His Highness the Maharaja. <i>Elvedon-hall, near Thetford.</i>
1870		Dibdin, Charles, Esq. 62, <i>Torrington-square, W.C.</i>
1870		Dibdin, Robert W., Esq. 62, <i>Torrington-square, W.C.</i>
1862		Dick, Captain Charles Cramond. <i>St. Stephen's Club, Westminster, S.W.</i>
1866		Dick, * Fitzwilliam, Esq. 20, <i>Carzon-street, Mayfair, W.</i>

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- 1861 Dick, Robert Kerr, Esq. (Bengal Civil Service). *Oriental Club, W.*
- 1830 Dickinson,\* Francis Henry, Esq., F.S.A. 121, *St. George's-square, Pimlico, S.W.*; and *Kingweston-park, Somerset.*
- 1877 Dickinson, Thomas B., Esq. 19, *Chesham-road, Brighton.*
- 1859 Dickson, A. Benson, Esq. 12, *Old-square, Lincoln's-inn, W.C.*
- 1877 Dickson, John, Esq. *Beyrout.* Care of G. C. Shaw, Esq., *Union Bank of London, 2, Princes-street, E.C.*
- 1875 Dickson,\* Oscar, Esq. *Stockholm.* Care of Messrs. Dickson Bros., 6, *Moorgate-street, E.C.*
- 1860 Dietz, Bernard, Esq., of Algoa Bay. 3, *Dorset-square, W.*
- 1859 Digby, G. Wingfield, Esq. *Sherborne-castle, Dorset.*
- 1860 Digby, Lieut.-Colonel John Almerous. *Chalmington-house, Cattstock, Dorchester.*
- 1859 Dilke,\* Sir Charles Wentworth, Bart., M.P. 76, *Sloane-street, S.W.*
- 1856 Dillon, Viscount. 113, *Victoria-street, S.W.*
- 1879 Dimmer, Augustus Henry, Esq. *Ormonde-house, Ryde, Isle of Wight.*
- 1880 Dimsdale, Joseph C., Esq. 50, *Cornhill, E.C.*
- 1873 Dineen, Thomas, Esq. 17, *Queen-street, Leeds, Yorkshire.*
- 1872 Divett, Edwd. Ross, Esq. *Reform Club, S.W.*
- 1878 Dixon,\* James, Esq., Jun. *Kingswood, Clapham-park*; and 81, *Gracechurch-street, E.C.*
- 1880 Dixon, John, Esq., C.E. *Choubra, Surbiton.*
- 1872 Dixon, Joseph, Esq. *Hillsbro'-hall, Sheffield.*
- 1877 Dobson, George, Esq. *Oakfield, Romilly-road, Cardiff.*
- 1873 Dodd, Jno., Esq. *Tamsui, Formosa.*
- 1876 Dodson,\* Geo. Edward, Esq. *Ravensknowle, Anerley, S.E.*
- 1854 Dodson, Right Hon. John George, M.P. 6, *Seamore-place, Mayfair, W.*
- 1876 Doran, Colonel John, C.B. *Percy-house, Leyland-road, Lee.*
- 1870 Dorchester, Dudley Wm. Carleton, Lord. 42, *Berkeley-square, W.*
- 1876 Dore, Henry J., Esq. 38, *Bruton-street, W.*
- 1873 Doria, Marchese Giacomo. *Genoa.* Care of Messrs. Kirkland, Cope and Co., 23, *Salisbury-street, Strand, W.C.*
- 1868 Douglas, John, Esq.
- 1870 Douglas, Hon. J.
- 1868 Douglas, Captain Neil D. Cecil F. 1, *Morpeth-terrace, Victoria-street, S.W.*; and *Guards' Club, S.W.*
- 1875 Douglas, Lieut.-General Sir Percy, Bart. *Henlade-house, Taunton, Somerset.*
- 1871 Douglas, Stewart, Esq. *Oriental Club, W.*
- 1879 Douglas,\* W. D. R., Esq. *Orchardton, Cistle Douglas, N.B.*
- 1879 Douglas, William, Esq., M.D. Care of James Ogston, Esq., Messrs. D. and C. McIvor's, 8, *Water-street, Liverpool.*
- 1874 Dowling, Edward Samuel, Esq. 14, *Holland-villas-road, Kensington, W.*
- 1871 Down, J. H. Langdon, Esq., M.D. 39, *Welbeck-street, W.*; and *Normansfield, Hampton Wick.*
- 1878 Downer, Richard Clarke, Esq. *Falcon-house, Gough-square, E.C.*

Year of Election.		
1879		Dowson,* Philip Septimus, Esq. <i>Cardiff, South Wales.</i>
1853		Doyle, Sir Francis Hastings C., Bart. <i>Custom-house, E.C.</i>
1872		Drew,* Frederic, Esq. <i>Eton College, Windsor.</i>
1878		Druitt, Thos. Wyard, Esq. 66, <i>Charing-cross, S.W.</i>
1869		Drummond,* Captain Alfred Manners. <i>Army and Navy Club, S.W.</i>
1865		Drummond, E. A., Esq. <i>Cadlands, near Southampton.</i>
1846		Drury, Vice-Admiral Byron. 4, <i>Cambridge-villas, Cheltenham.</i>
1877		Dryland, William, Esq. 38, <i>Brook-street, Grosvenor-square, W.</i>
1851		Du Cane,* Major Francis, R.E. 2, <i>Hardwick-road, Eastbourne, Sussex.</i>
1851	C.	Ducie,* Right Hon. Henry John, Earl of, F.R.S. 16, <i>Portman-square, W.</i>
1875		Duckham, Joseph Hy., Esq., R.N., Dockmaster, <i>West India Docks, Limehouse Entrance, E.</i>
1875		Du Faur, Eccleston, Esq. <i>Sydney, New South Wales. Care of Miss Du Faur, 74, Lansdowne-road, Kensington-park, W.</i>
1860	C.	Duff,* Right Hon. Mountstuart Elphinstone Grant, M.P. <i>York-house, Twickenham.</i>
1868		Duff, Wm. Pirie, Esq. <i>Calcutta. Care of Messrs. John Watson and Co., 34, Fenchurch-street, E.C.</i>
1857	PRES.	Dufferin,* Right Hon. Fredk. Temple Hamilton-Blackwood, Earl of, K.P., G.C.M.G., K.C.B., F.R.S. <i>Clandeboyne, near Belfast, Ireland.</i>
1866		Dugdale,* Captain Henry Charles G. <i>Merevale-hall, Atherstone, Warwick.</i>
1867		Dugdale,* John, Esq. 1, <i>Hyde-park-gardens; and Lhwyn, Llanfyllin, Oswestry.</i>
1868		Dunbar, John Samuel A., Esq. 3, <i>Edith-villas, W. Kensington.</i>
1863		Duncan, Major Francis, R.A., M.A., D.C.L., LL.D. <i>Scientific Club, 7, Savile-row, W.</i>
1861		Duncan,* George, Esq. 45, <i>Gordon-square, W.C.</i>
1875		Duncan, John, Esq.
1878		Duncan, William Alexander, Esq. <i>Herbert-terrace, Falloufield, near Manchester.</i>
1877		Duncan, W. H. G., Esq. <i>Care of Messrs. Anderson Brothers, 16, Philpot-lane, E.C.</i>
1879		Dunkley, Wm. W., Esq., M.D. <i>Foleshill, Coventry; and 7, Westminster-chambers, Victoria-street, S.W.</i>
1873		Dunlop, Alexander Milne, Esq. 3, <i>Old Palace-yard, Westminster, S.W.</i>
1875		Dunlop, Hamilton Grant, Esq. 11, <i>Rockstone-place, Southampton; and Junior Carlton Club, S.W.</i>
1859		Dunlop,* R. H. Wallace, Esq., C.B. (Indian Civil Service). 12, <i>Kent-gardens, Castle-hill, Ealing.</i>
1860		Dunmore,* Right Hon. Charles Adolphus Murray, Earl of. 109, <i>Cromwell-road, W.</i>
1875		Dunn, John M., Esq. 30, <i>Claverton-street, St. George's-square, S.W.</i>
1874		Dunn, Wm., Esq. 95, <i>Bishopsgate-street-within, E.C.</i>
1867		Dunraven, Right Hon. Wyndham Thos., Earl of. <i>Coombe-wood, Kingston-on-Thames.</i>
1875		Dunstone, J. John, Esq. 6, <i>Brighton-terrace, Govan, Glasgow.</i>

Year of Election.	
1856	Duprat, Le Vicomte. <i>Consul-Général de Portugal</i> , 10, <i>St. Mary-Axe, E.C.</i>
1869	Durham, Edward, Esq. <i>City-house, Little Chester, near Derby.</i>
1874	Duthie, Capt. W. H., R.A.
1868	Dutton,* Frederick H., Esq. <i>Palace-hotel, Buckingham-gate, S.W.</i>
1877	Dyason, John Sanford, Esq. 12, <i>Boscobel-gardens, N.W.</i>
1874	Dykes, William Alston, Esq. (Provost of Hamilton). <i>The Orchard, Hamilton, N. B.</i>
1870	Dymes, Daniel David, Esq. <i>Windham Club, S.W.</i>
1871	Earle, Arthur, Esq. <i>Childwall-lodge, Wavertree, near Liverpool; and Windham Club, S.W.</i>
1878	East, George, Esq., F.Z.S. 25, <i>Hyde-park-place, W.</i>
1877	Easton, Edward, Esq., C.E. 7, <i>Delahay-street, Westminster, S.W.</i>
1869	Eastwick, Edward B., Esq., F.R.S. 54, <i>Hogarth-road, S. Kensington, S.W.</i>
1857	Eastwick, Captain W. J. 12, <i>Leinster-gardens, Hyde-park, W.</i>
1876	Eaton, Commr. Alfred, R.N. <i>Brook-house, Mellington, near Liverpool.</i>
1862	Eaton,* Henry William, Esq., M.P. 16, <i>Prince's-gate, Hyde-park, S.W.</i>
1864	Eaton,* William Meriton, Esq. 16, <i>Prince's-gate, Hyde-park, S.W.</i>
1866	Eatwell, Surgeon-Major W. C. B., M.D. 69, <i>Inverness-terrace, W.</i>
1876	Ebden, Alfred, Esq. <i>Care of James Searight, Esq. 7, East India-avenue, E.C.</i>
1875	Ebden,* Charles J., Esq., B.A. <i>Coghurst-hall, Hastings.</i>
1861	Eber, General F.
1862	Ebury, Right Hon. Lord. 107, <i>Park-street, Grosvenor-square, W.; and Moor-park, Herts.</i>
1879	Eden, C. H., Esq. 16, <i>Warwick-square, S.W.</i>
1879	Eden, Rev. Robert. <i>Hôtel Beau Rivage, Ouchy, Switzerland.</i>
1858	Edge, Rev. W. J., M.A. <i>Combe-Martin-house, Upper Tooting, S.W.</i>
1863	Edgeworth, M. P., Esq. (Bengal Civil Service). <i>Mastrim-house, Anerley, S.E.</i>
1866	Edwardes,* Thomas Dyer, Esq. 5, <i>Hyde-park-gate, Kensington, W.</i>
1871	Edwardes,* Thomas Dyer, Esq., jun. 5, <i>Hyde-park-gate, Kensington, W.</i>
1868	Edwardes, Rev. A. T., M.A. 39, <i>Upper Kennington-lane, S.E.</i>
1865	Edwards, G. T., Esq., M.A. 7, <i>Queensborough-terrace, Kensington-gardens, W.</i>
1861	Edwards,* Henry, Esq., M.P. 53, <i>Berkeley-square, W.</i>
1871	Edwards, James Lyon, Esq. <i>Holmwood, Kingston-hill, Surrey.</i>
1860	Edwards, Colonel J. B., R.E., C.B. <i>United Service Club, S.W.; and Shorncliffe Camp, Kent.</i>
1853	Egerton, Rear-Admiral the Hon. Francis, M.P. <i>Devonshire-house, W.</i>
1868	Elder, A. L., Esq. <i>Campden-house, Kensington, W.</i>
1863	Elder,* George, Esq. <i>Knock-castle, Ayrshire.</i>

Year of Election		
1878		Elder, Sir Thomas. <i>Birkgate, Adelaide, S. Australia. Care of A. L. Elder, Esq., Campden-house, Kensington, W.</i>
1867		Eley, Charles John, Esq. 5, <i>Pelham-place, Kensington, S.W.</i>
1865	G. P.	Elias, Ney, jun., Esq. 33, <i>Inverness-terrace, Bayswater, W.</i>
1870		Ellenborough, Colonel Lord. <i>Holly Spring, Bracknell, Berks; and 44, Eaton-place, S.W.</i>
1876		Elles, Jamieson, Esq. <i>Wimbledon-common, S.W.</i>
1876		Elles, Lieut.-Col. Wm. K., C.B. <i>Horse Guards, War-office, Pall-mall, S.W.</i>
1875		Elliot,* Colonel Chas., C.B. <i>Wateringbury, Maidstone, Kent.</i>
1860		Elliot, G., Esq., C.E. <i>The Hall, Houghton-le-Spring, near Fence Houses, Durham.</i>
1857		Elliot,* Capt. L. R. <i>La Mailleraye-sur-Seine, Seine Inférieure. Care of J. L. Elliot, Esq., C4, Albany, W.</i>
1871		Elliot, William, Esq. <i>Care of Dr. Elliot, 93, Denmark-hill, S.E.</i>
1878		Elliot, Lieut. The Hon. William Fitzwilliam. 48, <i>Eaton-square, S.W.; and Minto-house, Hawick, N. B.</i>
1875	C.	Ellis, Sir Barrow H., K.C.S.I. (Mem. Council of India). 69, <i>Cromwell-road, S.W.; and India-office, S.W.</i>
1873		Ellis, Hon. Evelyn H. <i>Raleigh Club, Regent-street, S.W.</i>
1878		Ellis, Philip, Esq. <i>Wilford-grove, Nottingham.</i>
1865		Ellis, W. E. H., Esq. <i>Hasfield-rectory, W.; and Oriental Club, Gloucester Byculla Club, Bombay.</i>
1871		Ellis, Walter L. J., Esq. 7, <i>Brunswick-place, Regent's-park, N.W.</i>
1874		Elmslie, Jas. A., Esq. <i>Croscall-lodge, Bedford.</i>
1858		Elphinstone, Major Sir Howard C., V.C., R.E., K.C.B., C.M.G. <i>Buckingham-palace, S.W.</i>
1875		Elsey, Jno. Green, Esq. <i>Morant-house, Addison-road, Kensington, W.</i>
1872		Elwell, W. R. G., Esq. <i>Bathurst-lodge, Spring-grove, Isleworth.</i>
1868		Ely, John Henry Wellington Graham Loftus, Marquis of. 9, <i>Prince's-gate, S.W.; and Ely-castle, Fermanagh.</i>
1877		Emery, John, Esq. 15, <i>Dugnall-park-villas, South Norwood.</i>
1877		England, Capt. W. G., R.N. <i>St. George's-lodge, Ealing, W.; and United Service Club, Pall-mall, S.W.</i>
1863		Engleheart, Gardner D., Esq. <i>Duchy of Lancaster Office, Lancaster-place, W.C.</i>
1876		Errington, Geo., Esq., M.P. 16, <i>Albany, W.</i>
1876		Erskine,* Hon. Chas. H. S. <i>Alloa-park, Alloa, N. B.</i>
1870		Erskine, Claude J., Esq. (Bombay Civil Service). 87, <i>Harley-street, W.; and Athenæum Club, S.W.</i>
1852	P.	Erskine, Admiral John Elphinstone. 1 <i>L, Albany, W.; and Lochend, Stirling, N. B.</i>
1877		Escott, T. H. S., Esq. 38, <i>Brompton-crescent, S.W.</i>
1857		Esmeeade,* G. M. M., Esq. 50, <i>Park-street, Grosvenor-square, W.</i>
1877		Estoclet, Alphonse, Esq. <i>St. Mary's-college, Hanover-park, Peckham.</i>
1874		Evans,* B. Hill, Esq. <i>Devonshire-chambers, 17, Bishopsgate-without, E.C.</i>

Year of  
Election.

1870		Evans,* Edward Bickerton, Esq. <i>Whitbourne-hall, near Worcester.</i>
1877		Evans, Edward Prichard, Esq. 21, <i>Primrose-hill-road, Regent's-park, N.W.</i>
1876		Evans, Colonel E. L. M. <i>East India United Service Club, 14, St. James's-square, S.W.</i>
1857	C. p.	Evans, Captain F. J. O., R.N., C.B., F.R.S., F.R.A.S. <i>Hydrographic-office, Admiralty, S.W.</i>
1857		Evans, Thos. Wm., Esq., M.P. <i>Allestree-hall, Derby.</i>
1830		Evans,* W., Esq.
1865		Evans, Colonel William Edwyn. 55, <i>Seymour-street, Portman-square, W.</i>
1867		Evans, W. Herbert, Esq. <i>Forde Abbey, Chard, Dorset.</i>
1861		Evelyn, Lieut.-Colonel George P. <i>Hartley-manoir, Dartford, Kent.</i>
1851		Evelyn,* William J., Esq., F.S.A. <i>Wotton-house, Wotton, near Dorking.</i>
1830		Everett,* James, Esq., F.S.A.
1865		Everitt, George A., Esq. <i>Knowle-hall, Warwickshire.</i>
1874		Evill, William, Esq. <i>Claverton-house, Worcester-park, Surrey.</i>
1873		Ewart, John, Esq. 46, <i>Longridge-road, Earl's-court, S.W.</i>
1856		Ewing, J. D. Crum, Esq. <i>Fenchurch-avenue, City, E.C.</i>
1857	Gr. p.	Eyre, Edward J., Esq. <i>The Grange, Steeple Aston, Oxford.</i>
1861		Eyre, George E., Esq. 59, <i>Louendes-square, Brompton, S.W.</i>
1856		Eyre, Major-Gen. Sir Vincent, K.C.S.I. <i>Athenæum Club, S.W.</i>
1880		Fagan, Capt. C. S. F., R.M.L.I. <i>South Barracks, Walmer, Kent.</i>
1873		Fair, John, Esq. 50, <i>Hamilton-terrace, St. John's-wood, N.W.</i>
1870		Fairbridge, Charles, Esq. <i>Care of Rev. J. R. Izat, Balscott, near Banbury.</i>
1869		Fairfax, Captain Henry, R.N. <i>Army and Navy Club, S.W.</i>
1856		Fairholme, George Knight, Esq. <i>Care of Mr. Ridgway, 169, Piccadilly, W.</i>
1870		Fairland, Edwin, Esq., M.D. (Surg. 21st Hussars). <i>Lucknow, Oude.</i>
1838	p.	Falconer, Thomas, Esq. <i>Usk, Monmouthshire.</i>
1857		Falkland, Right Hon. Lucius Bentinck, Viscount. <i>Skutterskelfe, Yorkshire.</i>
1871		Fane, Edward, Esq. 14, <i>St. James's-square, S.W.</i>
1879		Fane, Henry Prinsep, Esq. <i>Fulbeck-hall, Grantham.</i>
1879		Fane, Wm. Dashwood, Esq. <i>Melbourne-hall, near Derby.</i>
1855		Fanshawe,* Admiral E. G., C.B. <i>Portsmouth.</i>
1878	p.	Farler, Ven. Archdeacon J. P. <i>Magila, Zanzibar. Care of Messrs. G. C. Scrutton and Co., St. Dunstan's-house, Idol-lane, E.C.</i>
1874		Farmer, Edmund, Esq. 10, <i>Southwick-place, Hyde-park-square, W.</i>
1873		Farmer, James, Esq. 6, <i>Porchester-gate, Kensington-gardens, W.</i>
1874		Farquhar, Walter, Esq. <i>Care of Messrs. Forbes, Forbes and Co., 9, King William-street, E.C.</i>
1868		Farquharson,* Major-Gen. G. M <sup>c</sup> B. <i>Breda by Alford, Aberdeenshire; and United Service Club, Pall-mall, S.W.</i>



Year of Election.	
1875	Farrer, Hy. Richd., Esq. 46, <i>Eaton-place, S.W.</i> ; and <i>Green Hammerton-hall, York.</i>
1863	Farrer,* W. Jas., Esq. 18, <i>Upper Brook-street, W.</i>
1876	Farzana, Mirza Rahim. ( <i>Teheran.</i> ) Care of Messrs. Grindlay and Co., 55, <i>Parliament-street, S.W.</i>
1877	Faulkner, Joseph, Esq. 101, <i>Asylum-road, S.E.</i>
1863	Faunthorpe,* Rev. J. P., M.A. <i>Whitelands Training-college, Chelsea.</i>
1869	Fawcett, Captain Edward Boyd, M.A. 3, <i>Barnpark-terrace, Teignmouth, Devon.</i>
1874	Fawssett, Frederick, Esq., M.D. <i>Westgate, Louth, Lincolnshire.</i>
1853	Fayrer,* Surgeon-General Sir Joseph, K.C.S.I., M.D. 16, <i>Granville-place, Portman-square, W.</i>
1875	Feilden, Capt. Hy. Wemyss, R.A. <i>Roppynden, Burwash, Sussex.</i>
1876	Feilden,* Lieut.-Col. O. B. (78th Highlanders). 7, <i>Sussex-gardens, Hyde-park, W.</i>
1880	Felkin, Robert W., Esq. <i>Eagle-house, Pennfields, Wolverhampton.</i>
1866	Felkin, William, Esq., jun., F.Z.S. Care of Mrs. H. Dawson, 8, <i>Stratford-square, Nottingham.</i>
1872	Fenner, William A., Esq.
1830	Fèret, Charles James, Esq. 49, <i>Edith-road, West Kensington, W.</i>
1875	Ferguson, Jno., Esq. 10, <i>Staple-inn, W.C.</i>
1840	C. Fergusson,* James, Esq., F.R.S., D.C.L. 20, <i>Langham-place, W.</i>
1875	Fergusson, Right Hon. Sir James, Bart., K.C.M.G. <i>Kilkeran, Maybole, N. B.</i>
1876	Ferris, Colonel W. Spiller. 1, <i>St. Michael's-gardens, Notting-hill, S.W.</i>
1871	Festing, Major Robert, R.E. <i>South Kensington Museum, S.W.</i>
1876	Few, Robert Hamilton, Esq. <i>Southery-grange, Lingfield-road, Wimbledon.</i>
1874	Fielden, Joshua, Esq., M.P. <i>Nutfield-priory, Redhill, Surrey.</i>
1878	Fielding, Charles, Esq. 9, <i>Cullum-street, E.C.</i> ; and <i>Verulam Club.</i>
1875	Figgis,* Samuel, Esq. <i>The Lawn, 105, Tulse-hill, S.W.</i>
1877	Finch, Jonadab, Esq. <i>Alma-house, Willesden.</i>
1877	Findlay, John, Esq. 24, <i>Pratt's-road, Clapton-park, E.</i>
1879	Finlay, Colonel J. B. <i>Russell Club, 316, Regent-street, W.</i>
1877	Finn, Alexander, Esq. <i>Teheran. Care of Messrs. Hickie, Borman and Co., Waterloo-place, S.W.</i>
1874	Firth, Fras. Helme, Esq. 25, <i>Cockspur-street, S.W.</i>
1870	Firth,* John, Esq., J.P. Care of Messrs. R. Buckland and Son, <i>Hop-gardens, St. Martin's-lane, W.C.</i>
1869	Fitch, Frederick, Esq., F.R.M.S. <i>Hadleigh-house, Highbury-new-park, N.</i>
1876	Fitz-Adam,* John T., Esq. 5, <i>Phillimore-gardens, Kensington, W.</i>
1857	Fitzclarence,* Commander the Hon. George, R.N. 1, <i>Warwick-square, S.W.</i>
1872	Fitzgerald, A., Esq. <i>Verulam Club, 54, St. James's-street, S.W.</i>
1874	Fitzgerald, G. V. S., Esq. <i>India-office, S.W.</i>
1861	Fitzgerald, Captain Keane.
1873	Fitz-Gerald, R. U. Penrose, Esq. 110, <i>Eaton-square, S.W.</i>
1873	Fitz-James, Frank, Esq., C.E. <i>Benares. Care of W. Whiteley, Esq., Westbourne-grove, Bayswater.</i>

Year of  
Election.

- 1874 Fitz Roy,\* Capt. Rob. O'Brien, R.N. *United Service Club, Pall-mall.*
- 1857 Fitzwilliam, The Hon. C. W., M.P. *Brooks's Club, St. James's-street, S. W.*
- 1837 Fitzwilliam,\* William Thomas, Earl. 4, *Grosvenor-square, W.; and Wentworth-house, Rotherham, Yorkshire.*
- 1863 Fleming, G., Esq. *Cathcart-lodge, Tyrewhitt-road, St. John's, S.E.*
- 1861 Fleming,\* John, Esq., C.S.I. *Wyck Elm-lodge, College-road, Dulwich.*
- 1878 Fleming, Sandford, Esq., C.M.G., F.G.S. *Ottawa, Canada.*
- 1865 Fleming, Rev. T. S. *The Vicarage, St. Clement's, Leeds.*
- 1853 P. Flemyng,\* Rev. Francis P. *Sgor Bheann, near Dunoon, Argyleshire.*
- 1857 Fletcher, Thomas Keddey, Esq. *Union-dock, Linehouse, E.*
- 1878 Fletcher, W. Henry, Esq. *Park-lodge, Blackheath-park, S.E.*
- 1879 Flint, Montague J. M., Esq. *Sutherland-house, Gunnersbury.*
- 1876 Floersheim,\* Louis, Esq. 11, *Hyde-park-street, W.*
- 1877 Florence, Ernest Badinius, Esq. 9, *Prince's-gate, Hyde-park, S.W.; and 5, Pump-court, Temple, E.C.*
- 1876 P. Floyer, Ernest A., Esq. *Care of Mrs. Floyer, 7, The Terrace, Putney, S.W.*
- 1877 Foggo, Geo., Esq. *Oriental Club, W.*
- 1873 Foggy, J. M. S., Esq. (Surg.-General). *Army and Navy Club, Pall-mall, S.W.*
- 1864 Foley, Lieut.-Gen. the Hon. St. George, C.B. 24, *Bolton-street, W.*
- 1876 Foljambe,\* Cecil G. S., Esq., M.P. *Cocklode, Ollerton, Newark.*
- 1874 Folkard, A., Esq. *Thatched-House Club, St. James's-street, S.W.*
- 1879 Follett, Charles John, Esq. 78, *Queen's-gate, S.W.*
- 1861 Foord, John Bromley, Esq. *May-villa, Bexley-heath.*
- 1874 Foot,\* Capt. C.E., R.N. *Care of Messrs. Woodhead and Hildreth, 44, Charing-cross, S.W.; and United Service Club, Pall-mall, S.W.*
- 1874 P. Forbes, A. Litton A., Esq. 53, *Margaret-street, Cavendish-square, W.*
- 1867 Forbes, Geo. Edward, Esq. *New Club, Edinburgh.*
- 1873 Forbes, General Jno., C.B. *Inverernan, Strathdon, Aberdeenshire; and Messrs. Forbes and Co., 25, Cockspur-street, S.W.*
- 1874 Forbes, Major Jno. G., R.E. *Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.; and 14, St. James's-square, S.W.*
- 1876 Forbes, J. S., Esq. *London, Chatham & Dover Railway Office, Victoria-stat., S.W.*
- 1860 Forbes, Lord, M.A. *Castle Forbes, Aberdeenshire.*
- 1873 Forbes, W. F., Esq. *Loch-cote-house, Bathgate, N. B.; and Castleton.*
- 1879 Forbes-Mitchell, J., Esq. *Thainstone, Kintone, Aberdeenshire, N. B.*
- 1869 Ford, Major-General Barnett (late Governor of the Andaman Islands). 31, *Queensborough-terrace, Hyde-park, W.*
- 1875 Ford,\* Francis Clare, Esq., C.B., C.M.G.
- 1874 Forde, Henry Charles, Esq., C.E. *St. Brendan's, Wimbledon, S.W.*
- 1874 P. Forlong,\* Major-General J. G. R. (Madras Staff Corps). *Chartered Mercantile Bank, 65, Old Broad-street, E.C.*
- 1872 P. Forrest,\* Alex, Esq., Survey Department of Perth. *Western Australia.*
- 1876 Forrest, James, Esq. *Kirriemuir, N. B.*
- 1872 Gr. P. Forrest,\* Jno., Esq. *Perth, Western Australia.*

Year of Election.		
1874		Forssman, Commr. O. A. (Consul for Portugal). <i>Potschefstroom, Transvaal Republic, S. Africa. Care of Vicomte Duprat, 10, St. Mary-Axe, E.C.</i>
1868		Forster, Hon. Anthony. 5, <i>Anglesea-terrace, St. Leonards-on-Sea.</i>
1876		Forster,* John, Esq. <i>Oriental Club, Hanover-square, W.</i>
1839		Forster,* Right Hon. William Edward, M.P. 80, <i>Eccleston-square, S.W.; and Burley, near Otley.</i>
1867	C. p.	Forsyth, Sir T. Douglas, K.C.S.I., C.B. 78, <i>Onslow-gardens, S. Kensington, S.W.</i>
1861		Forsyth, William, Esq., M.P., Q.C. 61, <i>Rutland-gate, S.W.</i>
1861		Fortescue,* Hon. Dudley F. 9, <i>Hertford-street, Mayfair, W.</i>
1873		Foss, Edward William, Esq. <i>Frensham-house, Croydon.</i>
1880		Foster, Major-General Charles, C.B. 7, <i>Montagu-square, W.</i>
1866		Foster, Edmond, Esq., jun. 130, <i>Lezham-road, Cromwell-road, W.</i>
1878		Foster, Norris T., Esq. <i>Adelaide-street, Vauxhall, Birmingham.</i>
1876		Foster, R. G., Esq. 4, <i>St. James's-place, Gloucester.</i>
1879		Foulkes, Rev. John. <i>Bangalore. Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1873		Fowler, A. Grant, Esq. <i>Care of Alex. Denoon, Esq., Beckenham, Kent.</i>
1863		Fowler,* J. T., Esq. <i>Care of Rev. A. Wilson, M.A., National Society's Depôt, Sanctuary, Westminster, S.W.</i>
1872		Fowler,* John, Esq., C.E. <i>Thornwood-lodge, Campden-hill, W.</i>
1850		Fowler,* Robert N., Esq., M.P., M.A. 50, <i>Cornhill, E.C.; and Tottenham.</i>
1866		Fox, D. M., Esq., Chief Eng. Santos and St. Paulo Railway. <i>St. Paulo, Brazil. Care of G. H. Hillier, Esq., 111, Gresham-house, Old Broad-street, E.C.</i>
1864		Fox,* Francis E., Esq., B.A. <i>Uplands, Tamerton Foliot, Plymouth.</i>
1876		Fox, Francis Wm., Esq. <i>Devonshire Club, St. James's-street, S.W.</i>
1876		Fox, Lieut. T. A., R.N.R. <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1879		Francis, Frederick, Esq. 36, <i>Courtfield-gardens, South Kensington, S.W.</i>
1865		Franks,* Aug. W., Esq. 103, <i>Victoria-street, S.W.</i>
1860		Franks, Charles W., Esq.
1862		Fraser, Captain H. A., L.N. <i>Zanzibar.</i>
1874		Fraser, Jas. Grant, Esq., C.E. 9, <i>Great Queen-street, Westminster, S.W.</i>
1866		Fraser, Captain T. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1868		Frater, Alex., Esq. H.M. Consul, <i>Tamsuy, Formosa. Care of James Frater, Esq., Town-house, Aberdeen.</i>
1879		Frazer, John, Esq. <i>Sydney, New South Wales; and 72, Cornhill, E.C.</i>
1872		Fredrichsen, Aug. Daniel, Esq. <i>St. Huberts, Hayne-road, Beckenham, Kent.</i>
1873		Freeland, H. W., Esq. <i>Chichester; and Athenæum Club, Pall-mall.</i>
1878		Freeling, Sir Sanford, K.C.M.G. (Governor of the Gold Coast Colony). 2, <i>Vyvyant-terrace, Clifton, near Bristol.</i>
1868		Freeman, Henry W., Esq. <i>Thirlestaine-hall, Cheltenham.</i>
1869		Freke, Thomas George, Esq. 1, <i>Cromwell-houses, Kensington, S.W.</i>

Year of Election.		
1853		Fremantle, Captain Hon. Edmund Robert, R.N., C.B., C.M.G. 20, <i>Eaton-place, S.W.</i>
1877		Frere, Lieut. Bartle C. A. <i>Care of Messrs. Cox and Co., Craig's-court, S.W.</i>
1850		Frere, Bartle John Laurie, Esq. 45, <i>Bedford-square, W.C.</i>
1867	PRES. p.	Frere, Right Hon. Sir Hy. Bartle Edw., Bart., P.C., G.C.B., G.C.S.I., D.C.L. <i>Athenæum Club, Pall Mall.</i>
1869	C. p.	Freshfield,* Douglas W., Esq. <i>Kilbrooke-park, East Griastead; 6, Stanhope-gardens, S. Kensington, S.W.; and United University Club, S.W.</i>
1873		Freshfield,* W. Dawes, Esq. 64, <i>Westbourne-terrace, W.</i>
1877	p.	Frewen, Richard, Esq. <i>Care of Messrs. Castle and Lamb, Fleet-street, E.C.</i>
1874		Frith, Rev. William. 3, <i>Brunswick-villas, Cambridge-road, Turnham-green.</i>
1876		Fry,* Frederick Morris, Esq. 14, <i>Montague-street, Russell-square, W.C.</i>
1876		Fry, Rev. Henry John. 57, <i>Vincent-square, S.W.</i>
1863		Fuidge, William, Esq. 5, <i>Park-row, Bristol.</i>
1865		Fuller, Thomas, Esq. <i>Trayton-house, Richmond-hill; and United University Club, S. W.</i>
1860		Fussell, Rev. J. G. Curry. 30, <i>Pembridge-gardens, Bayswater, W.; and Kiloskehane-castle, Templemore, Ireland.</i>
1868		Fyfe, Andrew, Esq., M.D. 112, <i>Brompton-road, S.W.</i>
1878	p.	Fynney, F. B., Esq. <i>Maritzburg, Natal. Care of R. J. Mann, Esq., 5, Kings-down-villas, Wandsworth-common, S.W.</i>
1866	p.	Fytche, Lieut.-General Albert, C.S.I. <i>Pyrgo-park, Havering-atte-Bower, near Romford, Essex; and Reform Club, S.W.</i>
1863		Gabrielli,* Antoine, Esq. 21, <i>Queen's-gate-terrace, Kensington, S.W.</i>
1875		Gahan, C. F., Esq. <i>Royal Naval Hospital, Great Yarmouth.</i>
1878		Gahan, Frederick, Esq., C.E. <i>Maherabeg, Donegal, Ireland; and Irish Church Club, Dublin.</i>
1878		Galbraith, James W., Esq. <i>Care of Messrs. Patrick Henderson and Co., St. Vincent-place, Glasgow.</i>
1877		Galbraith, Wm. Robert, Esq., C.E. 91, <i>Finchley-road, N.W.</i>
1872		Gale, Henry, Esq., C.E. <i>Care of Mr. A. S. Tacyford, 5, Southampton-street, Bloomsbury, W.C.</i>
1855		Galloway,* John James, Esq.
1869		Galsworthy, Frederick Thomas, Esq. 8, <i>Queen's-gate, Hyde-park, S.W.</i>
1873		Galsworthy, Robt. Herbert, Esq. 61, <i>Gloucester-place, Portman-square, W.</i>
1848	C.	Galton,* Captain Douglas, R.E. 12, <i>Chester-street, Grosvenor-place, S.W.</i>
1850	Gr. C. p.	Galton,* Francis, Esq., M.A., F.R.S. 42, <i>Rutland-gate, S.W.; and Athenæum Club, S.W.</i>
1871		Galton, Theodore Howard, Esq. <i>Hadzor-house, Droitwich.</i>
1854		Gammell,* Major Andrew. <i>Drumtochty, Kincardineshire, N.B.</i>
1877		Gardiner, Chas., Esq. <i>The Temple, Goring, Oxford.</i>

Year of Election		
1873		Gardiner,* H. J., Esq. <i>Hurstmead, Eltham, S.E.</i>
1869	p.	Gardner, Christopher T., Esq. (H.M. Consul, <i>Kiungchow, China</i> ). <i>Care of John Gardner, Esq., Subiaca-lodge, Roehampton-lane.</i>
1865		Gardner, Rear-Admiral G. H. <i>Woodside, Eltham.</i>
1876		Gardner, Henry Dent, Esq. <i>25, Northbrook-road, Lee.</i>
1866		Gardner, John Dunn, Esq.
1876		Garvagh, Lord. <i>31, Portman-square, W.</i>
1863		Gascoigne, Frederic, Esq.
1875		Gaskin, Rev. Joseph. <i>Chateau Belle Assise, Boulogne-sur-Mer. Care of J. H. Gaskin, Esq., Home-office, Whitehall, S.W.</i>
1859		Gassiot,* John P., jun., Esq. <i>The Culvers, Carshalton, Surrey.</i>
1866		Gastrell, Lieut.-Col. James E. (Beng. Staff Corps). <i>7, Lansdowne-rd., Wimbledon.</i>
1866		Gatty,* Charles H., Esq., M.A. <i>Felbridge-park, East Grinstead, Sussex.</i>
1880		Gavin, John, Esq. <i>27, Leadenhall-street, E.C.</i>
1873		Gawler, Colonel J. C. <i>Tower of London, E.C.</i>
1875		Gayfer, Wm., Esq., M.A., LL.D. <i>Middle-class-school, Bromley, Kent.</i>
1879		Gedge, Sydney, Esq. <i>Mitcham-hall, Mitcham.</i>
1873		Geiger,* Jno. Lewis, Esq. <i>75, Onslow-gardens, South Kensington, S.W.</i>
1878		Gell, Rev. A. Hamilton, M.A. <i>44, Eaton-square, S.W.</i>
1870		Gellatly,* Edward, Esq. <i>Uplands, Sydenham.</i>
1865		George, Rev. H. B. <i>New College, Oxford.</i>
1876		Ghewy,* Albert Brown, Esq., C.E.
1866		Gibb,* George Henderson, Esq. <i>13, Victoria-street, Westminster, S.W.</i>
1878		Gibbons,* Chas. Cockburn, Esq. (H.M. Vice-Consul, <i>Ponce, Porto Rico</i> ). <i>Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.</i>
1859	C.	Gibbs,* H. Hucks, Esq. <i>St. Dunstan's, Regent's-park, N.W.</i>
1873		Gibbs, James, Esq., C.B.I. <i>42, Longridge-road, South Kensington, S.W.</i>
1873		Gibbs, Jno. Dixon, Esq. <i>Conservative Club, St. James's, S.W.</i>
1870		Gibson, James Y., Esq. <i>Care of Messrs. Williams and Norgate, Henrietta-street, Covent-Garden, W.C.</i>
1877	Ex. p.	Giles, Ernest, Esq. <i>Care of G. A. Gill, Esq., Claremont, Studley-park, Melbourne, Victoria.</i>
1877		Giles, Rev. Wm. Theophilus, M.A. <i>Netherleigh, Chester.</i>
1877		Gilford,* Rear-Admiral the Right Hon. Lord. <i>8, Hereford-gardens, W.; and Admiralty, Whitehall, S.W.</i>
1874	p.	Gill, Captain W. J., R.E. <i>1, Edinburgh-mansions, Victoria-street; and Junior United Service Club, Charles-street, S.W.</i>
1866		Gillespie,* William, Esq. (of <i>Torbanke-hill</i> ). <i>46, Melville-street, Edinburgh.</i>
1868		Gillett,* Alfred, Esq.
1863		Gillett,* William, Esq. <i>6, William-street, Lowndes-square, S.W.</i>
1868		Gilliat, Algernon, Esq. <i>7, Lancaster-gate, W.</i>
1863		Gillies,* Robert, Esq., C.M. <i>Care of Messrs. Reith and Wilkie, Dunedin, Otago, N. Z. Per Messrs. Sampson Low and Co., 188, Fleet-street, E.C.</i>
1874		Gilman,* Ellis, Esq. <i>Berkeley-mansions, 64, Seymour-street, W.</i>

Year of  
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- 1877 Gisborne, Thomas Matthew, Esq. 4, *Upper St. Germain's, Blackheath, S.E.*
- 1864 Gladstone, George, Esq. 31, *Ventnor-villas, Cliftonville, Brighton.*
- 1863 Gladstone, J. H., Esq., PH.D. 17, *Pembroke-square, W.*
- 1862 Gladstone,\* Robert Stuart, Esq. *Windham Club, S.W.*
- 1873 Glauville, Silvanus Goring, Esq. *Stafford-villas, Lewisham High-road, S.E.*
- 1867 Glass, H. A., Esq. *St. Kilda, Vanbrugh-park, Blackheath, S.E.*
- 1872 Glass, James George Henry, Esq. 28, *London-street, Edinburgh.* *Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.*
- 1854 Glen, Joseph, Esq., Mem. Geogr. Soc. of *Bombay.* *Oriental Club, W.*
- 1879 Glover,\* G. B., Esq. 8, *Storey's-gate, S.W.*
- 1857 p. Glover, Capt. Sir John H., R.N., G.C.M.G. 27, *Bury-street, St. James's, S.W.*
- 1866 Glover, Robert Reaveley, Esq. 22, *Great St. Helen's, E.C.*
- 1870 Glover, Colonel T. G., R.E. *Barwood, Hersham, near Esher, Surrey.*
- 1864 Glyn, Sir Richard George, Bart. *Army and Navy Club, S.W.*
- 1878 p. Goad, Thomas William, Esq. *Care of Messrs. Coutts and Co., Strand, W.C.*
- 1874 Godman,\* F. Du Cane, Esq. 10, *Chandos-street, Cavendish-square, W.; and Child Okeford-house, Blandford.*
- 1874 Goldsmid, Bartle, Esq. 16, *Queen's-gate-terrace, S.W.*
- 1863 C. p. Goldsmid, Maj.-Gen. Sir Frederic John, K.C.S.I., C.B. 3, *Observatory-avenue, Kensington; and United Service Club, S.W.*
- 1861 Goldsmid, Sir Julian, Bart. 105, *Piccadilly, W.*
- 1880 Goldsmith, Staff-Commander W. B., R.N. *Royal Yacht 'Elfin,' Portsmouth.*
- 1873 Goldsworthy, R. Tuckfield, Esq., C.M.G. *Army and Navy Club.*
- 1860 Gooch, Thomas Longridge, Esq. *Team-lodge, Saltwell, Gateshead-on-Tyne.*
- 1877 Goodall, Abraham, Esq., F.R.C.S., Inspector-General of Hospitals (Retired List), 4, *Elveston-place, Queen's-gate, S.W.*
- 1864 Goodall, George, Esq. *Junior Carlton Club, S.W.*
- 1864 Goodenough,\* Colonel W. H., R.A. 49, *Weymouth-street, Portland-place, W.*
- 1880 Goodhart,\* Joseph Henry, Esq. *Manor-house, Tooting, Surrey.*
- 1875 Goodinge, Jas. W., Esq. 18, *Aldersgate-street, E.C.*
- 1874 Goodliffe, Fras. Kimber, Esq. *Cape of Good Hope.*
- 1877 Goodliffe,\* Henry, Esq. *Junior Athenæum Club, W.; and Admiralty, S.W.*
- 1877 Goodman, Alfred Wm., Esq. *Heath-house, Belvedere, Kent.*
- 1871 Goodwin,\* William, Esq.
- 1865 Goolden,\* Charles, Esq. *United University Club, S.W.*
- 1861 Goolden, Joseph, Esq. 18, *Lancaster-gate, W.*
- 1856 Gordon,\* General the Hon. Sir Alexander H., K.C.B., M.P. 50, *Queen's-gate-gardens, South Kensington, S.W.*
- 1878 Gordon, Major Edward Smith, R.A. *Royal Carriage Department, Royal Arsenal, Woolwich; and Naval and Military Club, Piccadilly, W.*
- 1879 Gordon, Rev. Geo. Maxwell. *Care of Major Gordon, R.A., Woolwich.*
- 1873 Gordon, J. Newall, Esq. *Morro Velho, Minas Geraes, Brazil; and 49, George-street, Portman-square, W.*
- 1874 Gordon, Robt., Esq., C.E. *Care of Mr. D. Nutt, 270, Strand, W.C.*

Year of Election.		
1870		Gordon, Russell Manners, Esq. <i>Care of Messrs. Roberts, Lubbock and Co., 15, Lombard-street, E.C.</i>
1866		Gore, Colonel Augustus F. <i>Care of Messrs. Hallett and Co., 7, St. Martin's-place, W.C.</i>
1853		Gore, Richard Thomas, Esq. <i>6, Queen-square, Bath.</i>
1874		Gore, Lieut. St. George C., R.E. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1879		Goren, James Newton, Esq. <i>6, Stone-buildings, Lincoln's-inn, W.C.</i>
1859		Gosling, Fred. Solly, Esq. <i>20, Spring-gardens, S.W.</i>
1875		Gotto, Hy. Jenkin, Esq. <i>Croft-lodge, Highgate-road, N.W.</i>
1868		Gough, Hugh, Viscount, F.L.S. <i>Lough Cutra Castle, Gort, Co. Galway.</i>
1876		Gould,* Abraham, Esq. <i>Somerset-lodge, 111, Adelaide-road, N.W.</i>
1873		Gould, Rev. Jas. Aubrey. <i>L 4, Albany, W.</i>
1846		Gould, John, Esq., F.R.S., F.L.S. <i>26, Charlotte-st., Bedford-square, W.C.</i>
1867		Grabham, Michael, Esq., M.D.
1868		Graeme, H. M. S., Esq. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1869		Graham, Andrew, Esq. (Staff Surg. R.N.). <i>Army and Navy Club, S.W.</i>
1858	C. p.	Graham, Cyril C., Esq., C.M.G.
1880		Graham,* H. R., Esq. <i>8, Hyde-park-square, S.W.</i>
1871		Graham, J. C. W. Paul, Esq. <i>Brooks's Club, St. James's-street, S.W.</i>
1879		Graham,* James, Esq. <i>Highwood-house, Kingston, Surrey.</i>
1874		Graham, James Henry Stuart, Esq. <i>1, Belgrave-road, Shepherd's-bush, W.</i>
1875		Graham, Robert Geo., Esq. <i>St. Albans, Hampton-on-Thames.</i>
1868		Graham,* Thomas Cuninghame, Esq. <i>Carlton Club, S.W.; and Dunlop-house, Ayrshire.</i>
1870		Grant,* Andrew, Esq. <i>Invermay-house, Bridge of Earn, N. B.</i>
1863	p.	Grant,* C. Mitchell, Esq.
1861		Grant, Daniel, Esq., M.P. <i>12, Cleveland-gardens, Hyde-park, W.</i>
1865		Grant,* Francis W., Esq. <i>40, Pall-mall, S.W.</i>
1860	Ex. C. p.	Grant, Lieut.-Col. James A., C.B., C.S.I., F.R.S. <i>E. India U. S. Club, S.W.; 19, Upper-Grosvenor-street, W.; and Househill, Nairn, N. B.</i>
1875		Grant, Jno., Esq. <i>Grampian-lodge, Putney.</i>
1878		Grant, Lieut. John Macpherson (92nd Highlanders). <i>The Castle, Ballindalloch, N. B.</i>
1879		Grant, W. J. A., Esq. <i>Hillesdon, Collumpton.</i>
1876		Grattan, Edmund A., Esq. (H. M. Consul, Antwerp). <i>Scientific Club, Savile-row, W.</i>
1872		Gray, Andrew, Esq.
1876		Gray,* Archibald, Esq. <i>37, Holland-park, W.; and 13, Austin Friars, E.C.</i>
1871		Gray, Matthew, Esq. <i>St. John's-park, Blackheath, S.E.</i>
1875		Gray,* Matthew Hamilton, Esq. <i>St. John's-park, Blackheath, S.E.</i>
1873		Gray, Robert Kaye, Esq. <i>St. John's-park, Blackheath, S.E.</i>
1868		Gray, Lieut.-Colonel William. <i>Farley-hall, Reading.</i>

Year of Election.		
1863		Greaves, Rev. Richard W. 1, <i>Whitehall-gardens, S. W.</i>
1876		Green, Geo. P. E., Esq. 100, <i>Gower-street, Bedford-square, W.C.</i>
1871		Green, Joseph E., Esq. 12A, <i>Myddelton-square, E.C.</i>
1876		Green, Colonel Malcolm, C.B. 78, <i>St. George's-road, S. W.</i>
1879		Green, Samuel, Esq. <i>Wardleworth, Rochdale.</i>
1868		Green, Rev. W., M.A. <i>Chaplain to the Tower of London.</i>
1869	C.	Green, Major-General Sir W. H. R., K.C.S.I., C.B. 93, <i>Belgrave-road, S. W.</i>
1879		Greene, Thomas Parnell, Esq. <i>Poulton-house, Hampton, Middlesex.</i>
1874		Greenfield, Thomas Challen, Esq. <i>Percy-house, Canning-road, Croydon.</i>
1857		Greenfield,* W. B., Esq. 35, <i>Glowcester-square, Hyde-park, W.; and Union Club, S. W.</i>
1870		Greenup, W. Thomas, Esq. <i>The Leys, Cambridge.</i>
1858	P.	Gregory,* Sir Augustus Charles. <i>Surveyor-General, Brisbane, Queensland, Australia.</i>
1858		Gregory, Charles Hutton, Esq., C.E. 1, <i>Delahay-street, Westminster, S. W.</i>
1860	P.	Gregory,* Francis Thomas, Esq. <i>Queensland.</i>
1872		Gregson, George, Esq. 63, <i>Harley-street, Cavendish-square, W.</i>
1857		Grellet,* Henry Robert, Esq. <i>Care of M. Misa, Esq., 41, Crutched Friars, E.C.</i>
1865		Grenfell, Henry R., Esq., M.P. <i>St. James's-place, S. W.</i>
1830		Greswell,* Rev. Richard, M.A., F.R.S. 39, <i>St. Giles's-street, Oxford.</i>
1877		Grey, Albert, Esq., B.A. <i>Dorchester-house, S. W.</i>
1866		Grey, Charles, Esq. <i>The Cottage, Staines.</i>
1837	C.	Grey,* Sir George, K.C.B.
1864		Grierson, Charles, Esq. <i>Care of Messrs. Hamilton and Co., 32, Paternoster-row, E.C.</i>
1876		Grierson, J., Esq., H.M. Consul, <i>Coquimbo. Care of Mrs. G. J. Cruikshank, Clair-villa, Saughtree, Dumfries.</i>
1874		Griesbach, C. L., Esq. <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1878		Griffin, Colonel James T. <i>Seaton-house, Adamson-road, N. W.</i>
1877		Griffin, John, Esq. <i>Dunster-house, Mincing-lane, E.C.</i>
1861		Griffith,* Daniel Clewin, Esq. 20, <i>Gower-street, W.C.</i>
1872		Griffiths, Arthur Edward, Esq. 25, <i>Talbot-square, Hyde-park, W.</i>
1877		Griffiths, Rev. John, M.A. <i>Belton-rectory, Grantham.</i>
1855		Grindrod, R. B., Esq., M.D., LL.D., F.L.S., &c. <i>Townsend-house, Malvern.</i>
1872		Grinlinton, J. J., Esq. <i>Colombo, Ceylon. Care of Edward Woods, Esq., C.E., 3, Great George-street, S. W.</i>
1861		Grosvenor, Lord Richard, M.P. 12, <i>Upper Brook-street, Bond-street, W.</i>
1876		Grove, George, Esq. <i>Lower Sydenham, S.E.</i>
1877		Grover,* Major George Edward, R.E. 28, <i>Collingham-place, Cromwell-road, S. W.</i>
1876		Guillemard, F. H. H., Esq. <i>Eltham, Kent.</i>
1879		Guinee, William Bernard, Esq. 7, <i>New-inn, Strand, W.C.</i>



## List of Fellows of the

Year of  
Election.

1878	Guinness, Cecil, Esq. <i>Verulam Club, St. James's, S. W.</i>
1876	Gunn, Arthur, Esq. 4, <i>Oak-villas, Hampstead, N. W.</i>
1861	Gunnell, Captain Edmund H., R.N. <i>Army and Navy Club, S. W.; and 21, Argyll-road, Campden-hill, W.</i>
1859	Gurney,* John H., Esq. <i>North Repps, Norwich.</i>
1857	Gurney, Samuel, Esq. 20, <i>Hanover-terrace, Regent's-park, N. W.</i>
1874	Gwynne, Fras. A., Esq. 15, <i>Bury-street, St. James's, S. W.</i>
1872	Gwynne,* James Eglinton A., Esq., C.E., F.S.A., J.P., &c. 97, <i>Harley-street, W.; and Cliff-house, Dovercourt, Essex.</i>
1876	Gwynne, Samuel G., Esq. <i>Shoul-hill-college, Cannock, Stafford.</i>
1865	Gwyther, John Howard, Esq. <i>Ellerslie, Park-hill-road, Addiscombe.</i>
1870	Habicht, Claudius Edward, Esq. 23, <i>Inverness-terrace, Bayswater, W.</i>
1878	Hadwen, John Henry, Esq. <i>Park-road, Wandsworth.</i>
1880	Haggard,* Edward, Esq. 5, <i>Great Cumberland-place, W.</i>
1877	Haines, C. Henry, Esq., M.D. 1, <i>South-terrace, Cork.</i>
1874	Hairby, Edward, Esq. 22, <i>Victoria-villas, King Edward's-road, S. Hackney.</i>
1868	Hale, Rev. Edward, M.A. <i>Eton College; and United University Club, S. W.</i>
1877	Halford, F. B., Esq. 26, <i>Cleveland-gardens, Hyde-park, W.</i>
1853	Halifax, Right Hon. Viscount, G.C.B. 10, <i>Belgrave-square, S. W.; and Hickleton, Yorkshire.</i>
1853	Halkett,* Rev. Dunbar S. <i>Little Bookham, Surrey.</i>
1853	Halkett,* Commander Peter A., R.N.
1874	Hall, Alex. Lyons, Esq. <i>Lyons-court, Ladbroke-road, Holland-park, W.</i>
1876	Hall, Ed. Alg., Esq. 131, <i>Piccadilly, W.</i>
1869	Hall,* James MacAlester, Esq. <i>Killeen-house, Tayinloan, Argyllshire.</i>
1862	Hall, James Tebbutt, Esq. <i>Eastcot-lodge, Cavendish-road, Brondesbury, N. W.</i>
1871	Hall, Admiral Robert, C.B. 38, <i>Craven-hill-gardens, W.; and Admiralty, S. W.</i>
1880	Hall, Russell King, Esq. 6, <i>Elgin-road, Kensington, W.</i>
1863	Hall, Thomas F., Esq., F.C.S. <i>Effingham-house, near Leatherhead.</i>
1876	Hall, Wm. Ed., Esq. <i>Care of Hon. Sir W. R. Grove, 115, Harley-street, W.</i>
1879	Halligey,* Rev. John Thos. Fredk. 23, <i>Belmont-road, Exeter.</i>
1878	Hallowes, Francis, Esq. 7, <i>Savile-row, W.</i>
1872	Halpin,* Capt. R. C. 38, <i>Old Broad-street, E. C.</i>
1871	Hamilton,* Lieut. Andrew (102nd Regiment). <i>The House of Falkland, Fife; and Naval and Military Club, W.</i>

Year of  
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- 1862 Hamilton, Archibald, Esq. *South Barrow, Bromley, Kent.*
- 1877 Hamilton, Charles Edward, Esq. *Apsley-house, Whitechurch, Monmouth.*
- 1861 Hamilton, Lord Claude. 82, *Portland-place, W.; and Barons-court, Co. Tyrone.*
- 1876 Hamilton, Jno. G. C., Esq. 54, *Eaton-place, S.W.*
- 1869 p. Hamilton, Admiral Richard Vesey. *Admiralty Office, Queenstown.*
- 1861 Hamilton, Col. Robert Wm. (Grenadier Guards). *Guards' Club, Pall-mall, S.W.*
- 1863 Hamilton, Rowland, Esq. *Oriental Club, W.*
- 1872 Hamilton, Walter, Esq. 21, *Magdalen-terrace, St. Leonard's-on-Sea.*
- 1846 Hamilton, Rear-Admiral W. A. Baillie. *Macartney-house, Blackheath, S.E.*
- 1876 Hammond,\* Navig.-Lieut. G. C., R.N. *Care of the Hydrographic-office, Admiralty, S.W.*
- 1880 Hammond, H. Alfred, Esq. *Aldenham-house, Swrbiton-hill, S.W.; and Royal Exchange, E.C.*
- 1874 Hanbury, R. W., Esq., M.P. *Ilam-hall, Ashbourne, Derbyshire.*
- 1876 Hancock, E. H., Esq. *Leigh-villa, The Avenue, Surbiton.*
- 1853 Hand,\* Admiral George S., C.B. *U. S. Club, S.W.*
- 1860 Handley,\* Benjamin, Esq. 56, *Eland-road, Lavender-hill, S.W.*
- 1874 Handley, Captain Francis (late I.N.). *Brighton Club, 55, Old Steine, Brighton.*
- 1879 Hanham, Sir Jno. A., Bart. 55, *Wilton-road, S.W.; and Dean's-court, Wimborne, Dorset.*
- 1866 Hanham, Commr. T. B., R.N. *Manston-house, near Blandford, Dorset.*
- 1861 Hankey,\* Blake Alexander, Esq.
- 1874 Hankey, Reginald, Esq. 71, *Chester-square, S.W.; and Arthur's Club, S.W.*
- 1870 Hankey,\* Rodolph Alexander, Esq. 54, *Warwick-square, S.W.*
- 1857 Hankey, Thomson, Esq. 59, *Portland-place, W.*
- 1837 Hanmer,\* Lord, F.R.S. 59, *Eaton-place, S.W.; and Hanmer-hall and Bettlesfield-park, Flintshire.*
- 1874 Hanmer,\* Philip, Esq., B.A. *Christchurch, New Zealand.*
- 1859 Hansard,\* Henry, Esq. 13, *Great Queen-street, W.C.*
- 1875 Hanson, R. B., Esq., M.A. *St. Saviour's Grammar-school, Southwark, S.E.; and Surrey County Club, Brixton, S.W.*
- 1840 Harcourt,\* Egerton V., Esq. *Whitwell-hall, York.*
- 1864 Hardie,\* Gavin, Esq. 5, *Queen-street, Mayfair, W.*
- 1864 Harding, Major Charles. *Grafton Club, 10, Grafton-street, Piccadilly, W.*
- 1864 Harding, J. J., Esq. 1, *Barnsbury-park, Islington, N.*
- 1877 Hare, Evan Herring, Esq. *St. John's-precincts, Putney, S.W.*
- 1875 Harford, Lieut. Henry Charles (99th Regiment).
- 1871 Hargrave,\* Joseph, Esq. *Fort Garry, Winnipeg, Manitoba, Canada. Care of the Hudson's Bay Company, 1, Lime-street, E.C.*
- 1874 Hargreaves, William, Esq.
- 1873 Harley, Colonel R. W., C.B., C.M.G. *Junior United Service Club, S.W.*
- 1868 Harper, J. A. W., Esq. 9, *Camden-house-road, S.W.*
- 1871 Harris, Edw., Esq. *Rydal-villa, Longton-grove, Upper Sydenham.*

Year of Election.	
1853	Harris, Admiral the Hon. Sir E. A. J., K.C.B. (H.B.M. Envoy Extraordinary and Minister Plenipotentiary, <i>The Hague, Holland</i> ). <i>Messrs. Woodhead and Co.</i>
1859	Harris, Capt. Henry, H.C.S. 35, <i>Gloucester-terrace, Hyde-park, W.</i>
1879	Harris,* Theodore, Esq. <i>The Cedars, Leighton Buzzard.</i>
1863	Harrison, Charles, Esq. 3, <i>Great Tower-street, E.C.</i>
1870	Harrison, Charles, Esq. 10, <i>Lancaster-gate, W.</i>
1877	Harrison, Wm. Arthur, Esq. 27, <i>Wesley-street, Waterloo, Liverpool.</i>
1838	C. Harrowby, Right Hon. Dudley, Earl of, F.R.S. <i>Sandon-house, Lichfield; and Norton, Gloucestershire.</i>
1873	Hart, Henry Neville, Esq. 107, <i>Harley-street, W.</i>
1875	Hart, James, Esq. <i>Winslow-house, South Norwood.</i>
1868	Hart,* J. L., Esq. 20, <i>Pembridge-square, W.</i>
1879	Hart, Lionel, Esq. <i>Care of Messrs. Samuel Dobree and Co., 6, Tokenhouse-yard, E.C.</i>
1879	Hart, Montagu P., Esq. 14, <i>St. George's-square, S.W.</i>
1854	Hartland,* F. Dixon-, Esq., M.P., F.S.A., &c. 14, <i>Chesham-place, S.W.; and the Oaklands, near Cheltenham.</i>
1874	Hartley, Sir Chas. Aug., F.R.S.E., &c. 26, <i>Pall-mall, S.W.; and Reform Club, Pall-mall, S.W.</i>
1874	Hartnell, Rev. Bedford, M.A. <i>Clifton-college, Bristol.</i>
1875	Harvey, Alex. S., Esq. 9, <i>Hatherley-groce, Westbourne-groce, W.</i>
1878	Harvey,* Sir Charles, Bart. <i>Rainthorpe-hall, Long Stratton.</i>
1862	Harvey, Charles, Esq. <i>Rathgar-cottage, Streatham, S.W.</i>
1867	Harvey, James, Esq. <i>Esk-street, Invercargill, Southland, New Zealand. Care of the Colonial Bank of New Zealand, 13, Moorgate-street, E.C.</i>
1864	Harvey, John, Esq.
1866	Harvey, Richard M., Esq. 13, <i>Devonshire-street, Portland-place, W.</i>
1877	Harvey,* Wm. C., Esq. <i>City Liberal Club, Walbrook, E.C.</i>
1871	Harvie,* Edgar Christmas, Esq. <i>City of London Club, Old Broad-street, E.C.</i>
1873	Harwood, S., Esq. <i>Hamilton-house, Leamington.</i>
1879	Harwood,* William, Esq. 31, <i>Lombard-street, E.C.</i>
1875	Haslam, Aug. Fred., Esq. 14, <i>Lawn-road, Haverstock-hill, N.W.</i>
1873	Hatherton, Lord. <i>Teddesley-park, Penkridge, Staffordshire.</i>
1875	Havilland, Rev. C. R. de. <i>Iwer, near Uxbridge, Bucks.</i>
1858	Hawker, Edward J., Esq. 37, <i>Cadogan-place, S.W.</i>
1873	Hawker, Geo. C., Esq. <i>Care of A. Scott, Esq., Messrs. W. Jackson and Co., 6½ Austin Friars, E.C.</i>
1876	Hawkins, Alf. Templeton, Esq. 35, <i>Spring-gardens, S.W.</i>
1840	Hawkins,* John, Esq.
1858	Hawkins,* Lieut.-Gen. J. Summerfield, R.E. <i>St. Leonards, St. James's-rd., Malvern.</i>
1876	Hawkins, Rev. Joshua. <i>The Nest, Howard-road, South Norwood.</i>
1873	Hawkins, Rev. W. Bentinck L., F.R.S. 33, <i>Bryanston-square, W.</i>
1876	Hawshaw,* Sir John, C.E., F.R.S. 33, <i>Great George-street, S.W.</i>

Year of Election.		
1861		Hawksley, Thomas, Esq., C.E. 14, <i>Phillimore-gardens, Kensington, W.</i>
1877		Haxell, E. Nelson, Esq., F.G.S., Netherlands. <i>Lewgars, Kingsbury, Middlesex.</i>
1871		Hay, Andrew, Esq. <i>Oriental Club, Hanover-square, W.; and Bombay.</i>
1863		Hay,* Rear-Admiral Lord John, M.P., C.B. <i>Fulmer-place, Slough.</i>
1852	C.	Hay,* Rear-Admiral Sir J. C. Dalrymple, Bart., C.B., F.R.S. 108, <i>St. George's-square, S.W.; U. S. Club, S.W.; Dunragit, Glenluce; and Harrow-on-the-hill, N.W.</i>
1877	p.	Hay, Capt. J. S. (Inspector-General of Houssa Forces). <i>Cape Coast Castle. Care of Sir Hector Hay, Bart., 2, Carlisle-place, Victoria-street, S.W.</i>
1872		Hay, Jno. Ogilvy, Esq. <i>Akyab, Arrakan, India.</i>
1872		Haydon, G. H., Esq. <i>Bethlehem Hospital, S.E.</i>
1874		Hayes, A. A., jun., Esq.
1879		Hayes,* Henry, Esq. <i>Exeter College, Oxford.</i>
1870		Haynes, Stanley L., Esq., M.D. <i>Malvern-link, Worcestershire.</i>
1864		Haysman, James, Esq. <i>Burgess-hill, Finchley-road, N.W.</i>
1871		Head, Geo. T., Esq. <i>East-cliff-house Grammar-school, Margate.</i>
1871		Head, Henry, Esq. <i>Stamford-hill, N.</i>
1880		Head, John Merrick, Esq. <i>Belle-vue, Reigate, Surrey.</i>
1876		Headley, Robert, Esq. 44, <i>Walham-grove, S.W.</i>
1878		Heane,* Lieut. James L., R.N. <i>Alte Burg, bei Aerzen, Prov. Hannover.</i>
1863		Heathfield, W. E., Esq. 30, <i>King-street, St. James's.</i>
1880		Heaton, John, Esq. <i>Garden-villa, Dodworth, near Barnsley.</i>
1878		Heaven, Rev. Charles, M.A. <i>The Vicarage, Horley, Banbury; and Beaconsfield Club, Castle-street, Birmingham.</i>
1861	p.	Hector, James, Esq., F.R.S., M.D. <i>Care of Agent-General for New Zealand, 1, Westminster-chambers, Victoria-street, S.W.</i>
1877		Hederstedt, Henry Burdett, Esq., C.E. 72, <i>Lancaster-gate, W.</i>
1873		Heeley, W. E., Esq. <i>Care of S. S. Geard and Son, 3, Guildhall-chambers, Basinghall-street, E.C.</i>
1876		Hegan,* Chas. John, Esq. <i>Oxford and Cambridge Club, Pall-mall, S.W.</i>
1871		Heinemann, N., Esq., PH.D. 80, <i>Upper Gloucester-place, Portman-square, W.</i>
1872		Helme,* Richard, Esq. <i>Walthamstow, Essex.</i>
1871		Henderson,* G., Esq., M.D., F.L.S. <i>Care of Messrs. King and Co., Pall-mall, S.W.</i>
1874		Henderson, Henry, Esq. 24, <i>Huntley-road, Elm-park, Liverpool.</i>
1853		Henderson, John, Esq. 2, <i>Arlington-street, Piccadilly, W.</i>
1874		Henderson, Lieut.-Colonel K. G. <i>Care of Sir C. M'Grigor, Bart., and Co., 25, Charles-street, S.W.; and Naval and Military Club, Piccadilly, W.</i>
1866		Henderson, Patrick, Esq. <i>Care of George Reid, Esq., 11, Crooked-lane, E.C.</i>
1876		Henderson,* P. L., Esq. 14, <i>Fenchurch-street, E.C.</i>
1875		Heneage, Charles, Esq. <i>St. James's Club, Piccadilly, W.</i>
1860		Hennessey, J. B. N., Esq. (1st Asst. Trig. Survey of India). <i>Dekhra Dhoon. Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>

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1875	Henriques, Alfred G., Esq. 96, Gloucester-terrace, Hyde-park, W.
1838	Henry, * Wm. Chas., Esq., M.D., F.R.S. <i>Haffield, near Ledbury, Herefordshire.</i>
1861	Henty, * Douglas, Esq. <i>Chichester.</i>
1872	Herbert, Charles E., Esq.
1875	Herbert, Horace Aug., Esq. <i>Care of Messrs. H. S. King &amp; Co., 45, Pall-mall, S.W.</i>
1876	Herries, Edward, Esq., C.B. <i>Athenæum Club, Pall-mall, S.W.</i>
1858	Hertslet, Sir Edward, C.B. <i>Librarian, Foreign-office, S.W.; and Belle-vue-house, Richmond.</i>
1871	Hertslet, Geo. Thos., Esq. <i>Lord Chamberlain's-office, St. James's-palace, S.W.</i>
1876	Hervey, Lord Francis, M.P. 3, <i>Spring-gardens, S.W.</i>
1877	Herz, * Dr. Cornelius. <i>San Francisco. Care of W. F. A. Archibald, Esq., 2, Temple-gardens, E.C.</i>
1877	Hetherington, J. Newby, Esq. 62, <i>Harley-street, W.</i>
1861	Heugh, John, Esq. 110, <i>Cannon-street, E.C.</i>
1873	Hewitt, Richard, Esq. <i>Elmfield, Esher, Surrey.</i>
1840	Heywood, * James, Esq., F.R.S. <i>Athenæum Club, S.W.; and 26, Kensington-palace-gardens, W.</i>
1869	Heywood, Samuel, Esq. 171, <i>Stanhope-street, Hampstead-road, N.W.</i>
1860	Heyworth, Lieut.-Col. Lawrence. <i>Wain Vaur, near Newport, Monmouthshire.</i>
1878	Hickie, Daniel, Esq. 23, <i>Queen Anne's-gate, S.W.</i>
1878	Hicks, Alfred, Esq. 74, <i>Great Russell-street, W.C.</i>
1867	Higgins, Edmund Thomas, Esq., M.B.C.S. 18, <i>Bloomsbury-street, E.C.</i>
1877	Hight, Capt. Edward. <i>Care of Messrs. F. Green and Co., 112, Fenchurch-street, E.C.</i>
1856	Hill, Arthur Bowdler, Esq. <i>South-road, Clapham-park, Surrey, S.W.</i>
1872	Hill, Clement L., Esq. <i>Foreign-office, S.W.</i>
1880	Hill, Frederick, Esq. <i>Haneston, Bedford-park, W. Croydon.</i>
1873	Hill, Henry, Esq. 122, <i>Leadenhall-street, E.C.</i>
1874	Hill, Capt. Jno., R.E. ( <i>Survey of India</i> ). <i>Calcutta; and Army and Navy Club, S.W.</i>
1879	Hill, Samuel Thomas, Esq. <i>Mile End Commercial-schools, Stepney-green, E.</i>
1854	Hill, Colonel Sir Stephen J., K.C.M.G., C.B. <i>Army and Navy Club, S.W.; and Droxford, Bishop's Waltham, Hants.</i>
1874	Hills, Major-General James, V.C., R.A., C.B. <i>Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>
1858	Hinchliff, T. Woodbine, Esq. 64, <i>Lincoln's-inn-fields, W.C.</i>
1862	Hinde, * Samuel Henry, Esq. <i>Windham Club, S.W.</i>
1878	Hippisley, Alfred Edward, Esq. 8, <i>Storey's-gate, S.W.; and Thatched-House Club, St. James's-street, S.W.</i>
1873	Hirst, William Henry, Esq. 103, <i>Mottram-road, Staleybridge, Cheshire.</i>
1873	Hirth, * Dr. F. <i>Imperial Maritime Customs, China; and 8, Storey's-gate, S.W.</i>

Year of Election.		
1870		Hitchins, Capt. T. M., R.A. 34, <i>Edge-lane, Liverpool.</i>
1880		Hoare, Arthur, Esq. <i>Stangrove-house, Edenbridge, Kent.</i>
1872		Hoare,* Henry, Esq. <i>Messrs. Hoare's Bank, Fleet-street; and St. James's-square, S. W.</i>
1868		Hoare, Samuel, Esq. 7, <i>Hereford-gardens, Park-lane, W.</i>
1876		Hobart, Major Bertie, R.A. <i>Care of R. N. Cust, Esq., 64, St. George's-square, S. W.</i>
1880		Hobday, Lieut. James. 73, <i>Cambridge-terrace, Hyde-park, W.</i>
1876		Hobson, Rev. J. P., M.A. <i>The Vicarage, Stanstead Abbots, Herts.</i>
1868		Hobson, Stephen James, Esq. 10, <i>Regent's-park-road, N. W.</i>
1874		Hochschild,* His Excellency Baron. 47, <i>Charles-street, Berkeley-square, W.</i>
1872		Hockin, Charles, Esq., M.A. 8, <i>Avenue-road, St. John's-wood, N. W.</i>
1875		Hodge, Edward W., Esq., F.G.S., <i>Netherlands. 4, Langham-place, W.</i>
1869		Hodges, Henry, Esq. <i>Brondesbury-lodge Collegiate-school, Kilburn.</i>
1856		Hodgson,* Arthur, Esq. <i>Clapton-house, near Stratford-on-Avon.</i>
1871		Hodgson, Henry Tylston, Esq. <i>Harpندن, St. Albans.</i>
1861		Hodgson,* James Stewart, Esq. 24, <i>Prince's-gardens, S. W.</i>
1869		Hodgson,* William H., Esq. <i>The Hill, Carlisle.</i>
1879		Hodson, C. E., Esq. <i>St. John's, Newfoundland.</i>
1868	p.	Holdich, Capt. Thos. Hungerford, R.E. 24, <i>Colville-square, Bayswater.</i>
1839		Holford,* Robert S., Esq. <i>Dorchester-house, Park-lane, W.</i>
1867	p.	Holland, Rev. Fred. Whitmore. <i>Evesham, Worcester.</i>
1861		Holland, Colonel James. <i>Southside, The Park, Upper Norwood, S.E.</i>
1880		Holland,* P. A., Esq. <i>New University Club, St. James's-street, S. W.</i>
1873		Holland, Lieut. Swinton C., R.N. <i>Care of Messrs. Hildreth and Woodhead, 44, Charing-cross, S. W.</i>
1875		Hollebone,* Fredk., Esq. <i>Ratensbourne-park, Catford-bridge, S.E.</i>
1871		Hollingworth,* Hy. Geo., Esq. 319, <i>Vauxhall-bridge-road, S. W.</i>
1876		Hollist,* Major E. O., R.A. <i>Queen's-hotel, Queenstown.</i>
1861		Holme, J. Wilson, Esq., M.A. 83, <i>St. George's-square, S. W.</i>
1876		Holmes, John, Esq. 9, <i>Norfolk-road, St. John's-wood.</i>
1874		Holmwood, T. D., Esq., 2, <i>Percival-terrace, Brighton.</i>
1839	p.	Holroyd,* Arthur Todd, Esq., M.D., F.L.S. <i>Master's-office, Sydney, New South Wales. Care of Edgar Howell, Esq., 3, St. Paul's-churchyard, E.C.</i>
1857		Holroyd, Henry, Esq. 14, <i>Kensington-gardens-terrace, W.</i>
1867		Holstein, The Marquez de Souza. <i>Lisbon. Care of the Portuguese Legation, 12, Gloucester-place, Portman-square, W.</i>
1869		Holt, George, Esq. <i>Union-street, Willenhall.</i>
1871		Holt, Henry F. W., Esq. <i>Redgrave, Victoria-road, Clapham-common, S. W.; and care of Messrs. King and Co., Cornhill, E.C.</i>
1872		Holt, Lieut. Sydney A., R.N.
1864		Holt, Vesey, Esq. 17, <i>Whitehall-place, S. W.</i>
1857		Homfray, William Henry, Esq. 6, <i>Storey's-gate, S. W.</i>
1875		Honeybourne, Jno. W. C., Esq. <i>St. Ives Grammar-school, Huntingdonshire.</i>
1864		Hood, Sir Alex. Acland, Bart. <i>St. Andrie's-park, Bridgwater, Somerset.</i>

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1873		Hood,* F. Jacomb, Esq. <i>Conservative Club, S.W.</i>
1866	P.	Hooker,* Sir Joseph, K.C.S.I., C.B., M.D., F.R.S., F.L.S., &c. <i>Director of the Royal Gardens, Kew.</i>
1868		Hooper, Alf., Esq. <i>City of London Club, Old Broad-street, E.C.</i>
1870		Hooper, George Norgate, Esq. <i>Etmleigh, Hayne-road, Beckenham, Kent.</i>
1870		Hooper, Rev. Robert Poole. 31, <i>Cambridge-road, Brighton.</i>
1875		Hooper, Wm. Edwd. Parry, Esq. 29, <i>St. George's-road, Kilburn, N.W.; and 17, New-street, Spring-gardens, S.W.</i>
1875		Hooper,* W. F., Esq. <i>Care of Mrs. Hugh Rees, Church-street, Carnarvon.</i>
1861		Hopcraft, George, Esq. 3, <i>Billiter-square, E.C.</i>
1846	C.	Hope,* Alex. James Beresford, Esq., M.P. <i>Arklow-house, Connaught-place, Hyde-park, W.; and Bedgebury-park, Hurst-green, Kent.</i>
1870		Hopkins,* Edward M., Esq. 3, <i>Upper Berkeley-street, W.</i>
1871		Hornby, Rev. James John, D.D. <i>Head Master of Eton College.</i>
1877		Horncastle, W. Geo., Esq. <i>The Acacias, Upper Clapton.</i>
1871		Horne, Francis, G. Esq. <i>Salmons, Caterham, Surrey.</i>
1876		Horniman,* Fred. Jno., Esq. <i>Surrey-house, Forest-hill.</i>
1869		Horrex, Theophilus, Esq. 18, <i>Connaught-square, Hyde-park, W.</i>
1876		Horsley, Thomas, Esq. <i>King's Newton, Derbyshire.</i>
1868		Horton, James Africanus B., Esq., M.D., &c. <i>Care of Sir C. McGrigor, Bart., and Co., Charles-street, St. James's, S.W.</i>
1861		Hoskins, Rear-Admiral A. H., C.B. <i>Army and Navy Club, S.W. Care of Messrs. Woodhead, 44, Charing-cross, S.W.</i>
1877		Hoskold, Henry Davis, Esq., C.E.
1853	C. p.	Houghton, Lord, D.C.L., F.R.S. <i>Travellers' Club, S.W.; The Hall, Bawtry; and Frystone-hall, Ferrybridge, Yorkshire.</i>
1878		Hounsell, William, Esq., J.P. <i>Mountfield, Bridport, Dorset.</i>
1874		Howard, A. C., Esq. 27, <i>Devonshire-place, Portland-place, W.; and Arthur's Club, S.W.</i>
1876		Howard, Charles C., Esq. <i>Christchurch, Canterbury, New Zealand. Care of Mr. E. Stanford, Charing-cross, S.W.</i>
1869		Howard, John, Esq., C.E. <i>Windsor-lodge, Linden-grove, S.E.</i>
1875		Howard, Joseph, Esq. <i>Tottenham-green.</i>
1873		Howard, Morgan, Esq., Q.C. <i>Temple, E.C.</i>
1857		Howard, Samuel Lloyd, Esq. <i>Goldings, Loughton, Essex.</i>
1873		Howard, William, Esq. 3, <i>Roslyn-bank, Lyndhurst-road, Hampstead, N.W.</i>
1875		Hozier, Lieut.-Colonel Jno. W. (Scots Greys). 11, <i>Hobart-place, Eaton-square, S.W.</i>
1842		Hubbard,* Rt. Hon. J. Gellibrand, M.P. 24, <i>Prince's-gate, Hyde-park, W.</i>
1867		Hubbard,* William Egerton, Esq. <i>Leonardslee, Horsham.</i>
1867		Hubbard,* William Egerton, jun., Esq. <i>Leonardslee, Horsham.</i>
1871		Hudleston,* Wilfred, Esq. 23, <i>Cheyne-walk, S.W.</i>
1870		Hudson, George B., Esq. <i>Frogmore-hall, Hertford; and New University Club, St. James's-street, S.W.</i>

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- 1872 Hudson,\* John, Esq. *Clyde-house, Redhill, Surrey.*
- 1880 Huggins, Hastings Charles, Esq. 11, *Kildare-gardens, W.*
- 1876 Hughes, A. W., Esq. *Care of F. P. Baker, Esq., 4, Bond-court, Walbrook, E.C.*
- 1857 Hughes, Captain Sir Frederic. *Pole, Hole, Wexford.*
- 1875 Hughes, J. Wm., Esq. *Bangor, Carnarvonshire.*
- 1873 Hughes, James, Esq. 328, *Camden-road, N.*
- 1876 Hughes, Joseph, Esq. *Lambourn-lodge, South-vale, Upper Norwood, S.E.*
- 1877 Hughes, Pringle, Esq. *Middleton-hall, Wooler, Northumberland.*
- 1877 Hughes,\* Thomas Francis, Esq. *Chinese Maritime Customs, 8, Storey's-gate, S.W.*
- 1875 Hughes, Capt. W. Gwynne. 14, *St. James's-square, S.W.*
- 1865 Hughes-Hallett, Major. *Junior United Service Club, S.W.*
- 1875 Hull, Staff-Comm. Thos. A., R.N. *Noo Wook, Wimbledon, S.W.*
- 1838 Hume,\* Edmund Kent, Esq.
- 1877 Hume, Lieut.-Colonel Gustavus. 115, *St. George's-square, S.W.*
- 1873 Hunt, John, Esq. 22, *Lancaster-gate, Hyde-park, W.*
- 1877 Hunt, W. G. Francis, Esq., R.N. 8, *Duke-street, St. James's; and Naval and Military Club, Piccadilly, W.*
- 1874 Hunt, William Thomas, Esq. 1, *Pembroke-villas, Bayswater, W.*
- 1876 Hunter, Major F. M. (Bombay Staff Corps). *Aden. 60, South-street, St. Andrew's, Fifeshire. Care of Messrs. H. S. King and Co., Cornhill, E.C.*
- 1875 Hunter, John, Esq. 9, *New-square, Lincoln's-inn, W.C.*
- 1874 Hunter, Capt. J. Edward, R.N. *Wensley-rectory, Bedall, Yorks; and United Service Club, Pall-mall, S.W.*
- 1879 Hunter, Colonel Montgomery (Bengal Staff Corps). *Delhi.*
- 1880 Hunter, William Leyland, Esq. 26, *Larkhall-rise, S.W.*
- 1872 Hunter, W. W., Esq., B.A., LL.D., C.I.E. 9, *Douglas-crescent, Edinburgh.*
- 1876 Huntingford,\* Lieut. G., R.N. *Ellacombe, Cleveland, Somerset.*
- 1877 Husband, John, Esq. *Goulton-road, Clapton.*
- 1872 Huson-More, James, Esq., M.A. 2, *Brook-street, Cheetham, Manchester.*
- 1871 Hutchins, F. Leigh, Esq. 22, *Queen's-gardens, Hyde-park, S.W.*
- 1871 Hutchinson,\* Colonel Alexr. Hadden, R.A., F.G.S. *Tenby, S. Wales.*
- p. Hutchinson, Edward, Esq. 8, *Sumner-place, South Kensington, S.W.*
- 1864 Hutchinson, Capt. R. R. *Verulam Club, 54, St. James's-street, S.W.*
- 1877 Hutchison, John W., Esq. *Balinaghie, Castle Douglas, N.B.; and Conservative Club, S.W.*
- 1870 Hutton,\* Charles W. C., Esq. *Belair, Duwich, S.E.*
- 1879 Hutton, William Pepperrell, Esq. *Kimberley, Griqualand West.*
- 1869 C. Huxley, Prof. T. H., F.R.S. 4, *Marlborough-place, St. John's-wood, N.W.; and 28, Jermyn-street, S.W.*
- 1860 Hyde,\* Captain Samuel.
- 1874 Hyndman, Hy. Mayers, Esq. 10, *Devonshire-street, Portland-place, W.*



Year of  
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1879	Ibrahim, Helmy, Pacha. 3, <i>Champion-terrace, Herbert-road, Plumstead.</i>
1852	Illingworth, Richard Stonhewer, Esq. 9, <i>Norfolk-crescent, Hyde-park, W.</i>
1850	Imray,* James Frederick, Esq. 89, <i>Minories, E.; and Beckenham, Kent.</i>
1878	Ince, Thomas Henry, Esq., F.Z.S. <i>Eltham-lodge, 191, Maida-vale, N.W.</i>
1861	Ingall,* Samuel, Esq. <i>Forest-hill, Kent, S.E.</i>
1851	Ex. C. p. Inglefield, Admiral Sir Edward A., C.B., F.R.S. <i>United Service Club, S.W.; and 99, Queen's-gate, S.W.</i>
1880	Inglis, Colonel T., R.E. 1, <i>Talbot-place, Blackheath.</i>
1846	Ingram, Hughes Francis, Esq. <i>University Club, S.W.</i>
1860	Inskip,* Capt. G. H., R.N. 1, <i>Huntiscombe-place, North-road, Plymouth.</i>
1852	Inskip,* Rev. Robert Mills, C.B. 1, <i>Huntiscombe-place, North-road, Plymouth.</i>
1877	Inverarity, Geo., Esq. 13, <i>Stanhope-gardens, S.W.</i>
1870	Irvine, James, Esq. 18, <i>Devonshire-road, Cloughton, Cheshire.</i>
1864	Irving,* John, Esq.
1861	Irwin, James V. H., Esq. 13, <i>Henstridge-villas, St. John's-wood, N.W.</i>
1877	Isbister, William, Esq. 56, <i>Ludgate-hill, E.C.</i>
1879	Isaacson,* F. Wootton, Esq. 152, <i>Harley-street, W.</i>
1877	Jack, R. L., Esq.
1873	Jackson, F. H. Ward, Esq. 9, <i>Albion-street, Hyde-park, W.</i>
1871	Jackson, Henry, Esq., Lieut. late I.N. (Chief Surveyor of the Province of Wellington). <i>New Zealand.</i>
1880	Jackson,* James, Esq. 13, <i>Avenue du Bois de Boulogne, Paris.</i>
1871	Jackson, Richd. Belgrave, Esq. 10, <i>Leonard-place, Kensington, W.</i>
1866	Jackson, Robert Ward, Esq. 136, <i>Inverness-terrace, Hyde-park, W.</i>
1871	Jackson, Thos. Hughes, Esq. <i>Manor-house, Birkenhead.</i>
1855	Jackson, William, Esq. 44, <i>Portland-place, W.</i>
1871	Jackson, Wm. Chas., Esq. 9, <i>Bucklersbury, E.C.</i>
1862	Jacomb, Thomas, jun., Esq. <i>Woodend, Holkington, St. Leonards-on-Sea.</i>
1875	Jagg, Rev. F. Charles. <i>Luddenham-rectory, Faversham, Kent.</i>
1878	Jago,* Lieut.-Colonel John. <i>Penang. Care of Messrs. Cox and Co., Craig's-court, S.W.</i>
1880	James, John O. N., Esq. <i>Surveyor-General's Office, Calcutta.</i>
1877	James, Walter Knight, Esq. <i>Normal College, Colombo, Ceylon; and 22, Pelham-street, Nottingham.</i>
1870	James, William Morris, Esq. 8, <i>Lyndhurst-road, Hampstead, N.W.</i>
1878	Jamieson, Capt. A. Wm. (7th N. I., <i>Lucknow, Upper India</i> ). <i>Oakhill, near Bath.</i>
1868	Jamieson, Hugh, Esq. <i>Junior Carlton Club, S.W.</i>
1877	Janvrin, A. F., Esq. 49, <i>Pall-mall, S.W.</i>
1880	Japp, Alexander Hay, Esq. 13, <i>Albion-square, Dalston.</i>

Year of Election.	
1862	Jaques,* Leonard, Esq. <i>Wentbridge-house, Pontefract, Yorkshire.</i>
1863	Jardine,* Andrew, Esq. <i>Lanrick-castle, Stirling.</i>
1863	Jardine,* Robert, Esq., M.P. <i>Castlemilk, Lockerby, N. B.</i>
1875	Jardine,* Robert, Esq. 21, <i>Queensbury-place, South Kensington, S.W.</i>
1871	Jarrad, Lieut. F. W., R.N. <i>Care of Edw. M. Roe, Esq., Royal Hospital Schools, Greenwich.</i>
1876	Jeakes, Rev. James. 54, <i>Argyll-road, Kensington, W.</i>
1879	Jeffery, William James, Esq. <i>Grammar School, Bideford, Devon.</i>
1865	Jeffreys, J. Gwyn, Esq., LL.D., F.R.S. <i>Ware-priory, Herts.</i>
1876	Jeffries, Wm. H., Esq. 111, <i>Southgate-road, Islington, N.</i>
1875	Jeffs, Richard, Esq. 244, <i>Regent-street, W.</i>
1854	Jellicoe, Charles, Esq. 12, <i>Cavendish-place, W.</i>
1837	Jenkins,* R. Castle, Esq. <i>Beachley, near Chepstow.</i>
1877	Jenkins, Commander R. P., R.N. 2, <i>Cambridge-villas, Oakfield-road, Croydon.</i>
1880	Jenkinson, Edward, Esq. <i>Admiralty, S.W.; and East India United Service Club, St. James's-square, S.W.</i>
1874	Jenkinson,* H. Irwin, Esq. <i>Keswick, Cumberland.</i>
1875	Jennings, Samuel, jun., Esq. 58, <i>Grangeville-park, Blackheath.</i>
1854	Jennings,* William, Esq., M.A. 13, <i>Victoria-street, Westminster, S.W.</i>
1876	Jephson, Mountney, Esq. <i>Garrick Club, Garrick-street, W.C.</i>
1880	P. Jephson, N. A., Esq. 66, <i>Portsmouth-road, Maida-vale, W.; and County Club, 44, Albemarle-street, W.</i>
1874	Jeppe, Le Chevalier Fred. <i>Care of S. W. Silver, Esq., 4, Sun-court, Cornhill, E.C.</i>
1860	Jermyn, Rowland Formby, Esq. <i>War-office, S.W.</i>
1878	Jervois, Major-General Sir W. Drummond, G.C.M.G., C.B. ( <i>Governor of South Australia</i> ).
1873	Jervis, Theodore, Esq. 66, <i>Denbigh-street, S.W.</i>
1870	Jessop, Captain Thomas. <i>Honley, Huddersfield.</i>
1864	Jeula,* Henry, Esq. <i>Lloyds, E.C.</i>
1874	Jeune, Fras. H., Esq. 140, <i>Cromwell-road, S.W.</i>
1878	Jinman, George, Esq. 110, <i>Cannon-street, E.C.</i>
1876	Joaquim, J. P., Esq. <i>Care of W. B. D'Almeida, Esq., 2, Pump-court, Middle-Temple, E.C.</i>
1873	Jocelyn, Hon. W. Nassau. <i>Care of Foreign-office, S.W.</i>
1879	Johns, Edward Wildy, Esq. 41, <i>Petherton-road, Highbury, N.</i>
1876	Johnson, F. Bulkeley, Esq. 5, <i>The Mount, St. Leonards-on-Sea; and Devonshire Club, St. James's-street, S.W.</i>
1876	Johnson, Joseph, Esq. 89, <i>Carleton-road, Tufnell-park, N.</i>
1876	Johnson, Murray, Esq. 20, <i>Austin Friars, E.C.</i>
1866	T. p. Johnson, W. H., Esq. (Civil Assistant G. T. S. India).
1875	Johnston,* A., Esq. 6, <i>Paternoster-buildings, E.C.</i>
1879	Johnston, Andrew C., Esq. (Surgeon, R.N.), M.K.Q.C.P. <i>Salen, Loch Sunart, Fort William, N. B.</i>

Year of Election.	
1876	Johnston, Chas. Edwd., Esq. 10, <i>Hyde-park-gate, Kensington, S.W.</i>
1878	Johnston, Geo., Esq., M.D. 15, <i>St. Stephen's-green, Dublin.</i>
1874	Johnston,* Capt. H. B. <i>United Service Club, Dublin; and Junior Carlton Club, Pall-mall, S.W.</i>
1857	Johnston, J. Brookes, Esq.
1875	Johnston, Robert, Esq. <i>Woodlands, Monkstown, Dublin.</i>
1871	Johnston, T. B., Esq., F.R.S.E. 16, <i>South St. Andrew-street, Edinburgh.</i>
1866	Johnstone, General H. C., C.B., F.R.A.S. <i>Hutton-lodge, Aldridge-road, Westbourne-park, W.</i>
1867	Johnstone,* John, Esq. <i>Castelnau-house, Mortlake, S.W.</i>
1873	Johnstone, W. Woods, Esq., M.D. 44, <i>Prince's-square, W.</i>
1872	Jolley, Rev. William Rowe, M.A., Hon. Chaplain to the Queen. <i>St. John's Parsonage, Birkenhead.</i>
1875	Jones, Arthur W., Esq. 10, <i>Eaton-square, S.W.</i>
1874	Jones, Edwin, Esq. <i>Fairlea, Bassett, Southampton.</i>
1876	Jones, Hugh H., Esq. <i>Larkhill, Liverpool.</i>
1868	Jones, Capt. H. M., V.C. <i>Care of Messrs. Bickers and Son, 1, Leicester-square, W.C.</i>
1857	Jones, Lieut.-General Jenkin, R.E. " <i>Woodside," St. Helens, Ore, Hastings.</i>
1862	Jones, John, Esq. 338, <i>Strand, W.C.</i>
1872	Jones, Staff-Commander Jno., R.N. <i>The Blue Bell, Welshpool, Montgomeryshire.</i>
1878	Jones, John James, Esq. <i>Belgrade-house, Meynell-road, South Hackney, E.</i>
1878	Jones, Major R. Owen, R.E. <i>Ordnance Survey-office, 46, St. George's-road, S.W.</i>
1876	Jones,* R. T., Esq. 1, <i>St. Alban's-road, Highgate-hill, N.</i>
1876	Jones,* Thomas M. Rymer, Esq., C.E., Japan. <i>Care of T. R. Jones, Esq., 52, Cornwall-road, Westbourne-park, W.</i>
1876	Jones, Rev. W. Taylor, M.A. <i>The College, Sydenham.</i>
1880	Jones, Walter Evans, Esq. <i>Hanover-square Club, W.</i>
1878	Jones, Sir Willoughby, Bart. <i>Cranmer-hall, Fakenham, Norfolk.</i>
1873	Jones, Winslow, Esq. <i>Devon and Exeter Institution, Exeter.</i>
1878	Jones, W. J. Esq. <i>Buckingham.</i>
1878	Jopp, Capt. A. Abercrombie, R.E. 18, <i>Tregunter-road, South Kensington, S.W.</i>
1879	Jordan, Rev. Joseph. 65, <i>Maryon-road, Charlton, S.E.</i>
1867	Jordan,* Wm. Leighton, Esq. <i>Care of Dr. Wallich, 3, Christchurch-road, Roupell-park, Brixton, S.W.</i>
1863	Joshua,* Moss, Esq. <i>Bishopshalt, Hillingdon.</i>
1876	Joyner,* Henry Batson, Esq., C.E. <i>Yamato Yashiki, Tokyo, Japan. Care of H. S. J. Joyner, Esq., Northwick-house, Harrow.</i>
1878	Joyner, Robert Batson, Esq. <i>Care of H. S. J. Joyner, Esq., Northwick-house, Harrow.</i>
1878	Jupe,* Jno., Esq. <i>Lloyd's, E.C.</i>

Year of Election.

- 1876 Kane, Dr. Matthew, M.D. *Lanherne, Kingston-hill.*
- 1873 Kane, Dr. William. *Care of M. Kane, Esq., M.D., Lanherne, Kingston-hill.*
- 1868 Kantzow, Admiral H. P. de. 1, *Observatory-gardens, Campden-hill-road, W.*
- 1877 Karuth, Frank Oscar, Esq. *Oakhurst, The Knoll, Beckenham, Kent.*
- 1875 Kavanagh, T. Frank P., Esq.
- 1858 Kay, David, Esq. 19, *Upper Phillimore-place, Kensington, W.*
- 1876 Kay, H. C., Esq. 11, *Durham-villas, Kensington, W.*
- 1877 Keane, Richard F., Esq., C.E. *Derruheen-house, Cappoquin, Ireland.*
- 1857 Keating, Right Hon. Sir Henry Singer. 11, *Prince's-gardens, S.W.*
- 1879 Keeling, Frederic John, Esq. *St. Mary's-terrace, Colchester.*
- 1873 Keightley,\* Alfred D., Esq. *Milnthorpe, Penrith, Westmoreland.*
- 1875 Keir, Campbell M., Esq. *Oriental Club, Hanover-square, W.*
- 1875 Keir, Jno. Lindesay, Esq. *Fordlands, Bideford.*
- 1864 Keir, Simon, Esq. *Conservative Club, S.W.*
- 1879, Kell, Robert, Esq. 53, *Devonshire-street, W.; and Wanderers' Club, S.W.*
- 1879 Kellner, Sir George, K.C.M.G. *Oriental Club, Hanover-square, W.*
- 1860 Kemball,\* General Sir Arnold Burrowes, K.C.B., K.C.S.I. *United Service Club, S.W.; and 79, Queen's-gate, S.W.*
- 1869 Kemp, Geo. L., Esq., Calcutta. *Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
- 1873 Kemp, Rev. Henry William, B.A. *The Charter-house, Hull.*
- 1863 Kempster, J., Esq. 1, *Portsmouth-place, Kennington-lane, Surrey, S.E.*
- 1878 Kendall, James, Esq. 16, *Park-road, Wandsworth-common, S.*
- 1861 Kennard, Adam Steinmetz, Esq. *Crawley-court, Winchester.*
- 1877 Kennard, James, Esq. *Morton-house, Middleton, Lancashire.*
- 1877 C. Kennaway,\* Sir John H., Bart., M.P. *Escot, Ottery St. Mary, Devon.*
- 1875 Kennedy, John, Esq. 13, *Brooklyn-road, Shepherd's-bush, W.*
- 1854 Kennedy, Rev. John, M.A. 27, *Stepney-green, E.*
- 1875 Kennedy, Rear-Admiral Jno. Jas., C.B. 39, *Onslow-square, S.W.; and United Service Club, Pall-mall, S.W.*
- 1871 Kennion, Rev. George Wyndham, B.A. *All Saints'-vicarage, Bradford, Yorkshire.*
- 1875 Kent, Fras. A., Esq. *Kesgrave-hall, Suffolk.*
- 1872 Kerr, Alexander, Esq., Wellington, New Zealand. *Care of Norman S. Kerr, Esq., M.D., 42, Grove-road, St. John's-wood, N.W.*
- 1874 Kerr, Major-General Lord Mark, C.B.
- 1875 Kettle,\* Daniel W., Esq. *Hayes-common, Beckenham; and 53, Fleet-street, E.C.*
- 1879 Key, Admiral Sir Astley Cooper, K.C.B. 5, *Cranley-place, S.W.; and United Service Club, Pall-mall, S.W.*
- 1857 Keysell, Francis P., Esq. *Grove-house, Cheshunt.*
- 1864 Kiddle,\* Staff-Commr. W. W., R.N. 70, *Upper Leeson-street, Dublin.*
- 1878 Kilgour, Geo., Esq.
- 1878 Kilham, Thomas, Esq. *Upper Grosvenor-road, Tunbridge Wells.*

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1874		Killam, Frank, Esq. <i>Yarmouth, Nova Scotia. Care of Messrs. T. C. Jones and Co., 26, Chapel-street, Liverpool.</i>
1864		Kimber, Dr. E. 13, <i>Park-villas, Shepherd's-bush, W.</i>
1880		Kimberley, Right Hon. The Earl of. 35, <i>Lowndes-square, S.W.; and Kimberley-house, Wymondham, Norfolk.</i>
1874		Kincaid, Thomas, Esq. 9, <i>Lansdown-crescent, Glasgow.</i>
1879		King, Edward, Esq. 1, <i>Elvaston-place, Queen's-gate, S.W.</i>
1875		King, E. H., Esq. <i>Killcott, Godalming, Surrey.</i>
1872		King, James, Esq. 12, <i>Claremont-terrace, Glasgow.</i>
1866		King, John, Esq. <i>Compton-field-place, Guildford, Surrey.</i>
1874		King, Hon. J. P. Locke. 38, <i>Dover-street, W.; and Brooklands, near Weybridge, Surrey.</i>
1877		King, Joseph, Esq. <i>Arkwright-road, Hampstead, N.W.</i>
1873		Kingsley,* Maurice, Esq. <i>Engineer's Office, Oswego, State of New York, U.S.A.</i>
1857		Kinnaird,* Arthur F., Lord, 2, <i>Pall-mall East, S.W.</i>
1875		Kintore, Earl of. <i>Guthrie Castle, Arbroath; and Carlton Club, Pall-mall, S.W.</i>
1878		Kirby, William, Esq. 18, <i>John-Street, West-cliff, Whitby, Yorkshire.</i>
1858	C. p. T.	Kirk, John, Esq. M.D., C.M.G. (H.M. Agent and Consul General, Zanzibar).
1863		Kirke, John, Esq. <i>Oriental Club, W.</i>
1870		Kirkland, Major-Gen. John A. Vesey. <i>Wester Fordel, Milnathort, N.B.</i>
1868		Kisch, Daniel Montagu, Esq. 15, <i>Westbourne-park-terrace, W.</i>
1875		Kitchener, Lieut. H. H.
1866		Kitson,* James, jun., Esq. <i>Spring-bank, Headingley, Leeds.</i>
1868		Kitto, Richard L. Middleton, Esq. <i>Preston-lodge, Prestonpans, N.B.</i>
1867		Knight, Andrew Halley, Esq. 62, <i>Holland-park, W.</i>
1876		Knight, Wm. Duncan, Esq. <i>Avening-house, Greenhill-park, Hampstead.</i>
1862		Knollys, General Rt. Hon. Sir William T., K.C.B. <i>Blount's-court, Henley-on-Thames.</i>
1871		Knollys, Lieut.-Col. W. W. (93rd Highlanders). 102, <i>Belgrave-road, S.W.</i>
1874		Knowles, George, Esq., C.E. <i>Billiter-house, Billiter-street, E.C.</i>
1867		Knox, Alex. A., Esq. 91, <i>Victoria-street, Westminster, S.W.</i>
1861		Knox, Sir Thomas G., K.C.M.G. (H.M. Consul General, Siam). <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1874		Koppel, S., Esq.
1866	p.	Kopsch, Henry, Esq. <i>Imperial Maritime Customs, China; and 8, Storey's-gate, S.W.</i>
1876		Kurnalkur, Abdul Hakk (Extra Assist.-Commissioner, <i>Basim, Berar, India</i> ).
1861		Kyd, Hayes, Esq., M.R.C.S. <i>Wadebridge, Cornwall.</i>
1875		Kynaston, Rev. Herbert. <i>Montpellier-lodge, Cheltenham.</i>

Year of  
Election.

- 1859 Labrow, Lieut.-Colonel Valentine H., F.S.A., F.G.S. *Mitre-court-chambers, Temple, E.C.; and Club-chambers, S.W.*
- 1849 Laffan,\* Maj.-Gen. Sir Robert Michael, B.E., K.C.M.G. *Army and Navy Club, S.W.*
- 1876 Lafone, Alfred W., Esq. *The Elms, Halton.*
- 1870 Laing, Arthur, Esq. 29, *Mincing-lane, E.C.*
- 1879 Laing, John William, Esq. *Mayo College, Ajmere, Rajpütana; and New University Club, St. James's-street, S.W.*
- 1875 Laing, Joseph, Esq. 17, *Castelnau-villas, Barnes, S.W.*
- 1877 Laing, Robert A., Esq. 3, *St. Peter's-road, Croydon.*
- 1877 Laing, Seton, Esq. 3, *Observatory-gardens, Campden-hill, Kensington, W.; and Reform Club, Pall-mall, S.W.*
- 1878 L'Aker, John, Esq. *Hever-lodge, Maidstone.*
- 1869 p. Lamb, Hon. Edward William. *Brisbane, Queensland, Australia.*
- 1859 Lamb, Lieut. Henry, I.N. *H.M. India Store Department, Belvedere-road, Lambeth, S.E.*
- 1863 Lambert,\* Alan, Esq. *Heath-lodge, Putney-heath, S.W.*
- 1877 Lambert,\* C. J., Esq. 1, *Crosby-square, E.C.*
- 1875 Lambert,\* Cowley, Esq. *New University Club, St. James's-street, S.W.*
- 1878 Lambert, Rev. Frederick Charles. 62, *St. Andrew-street, Cambridge.*
- 1876 Laming, James, Esq. 1, *Bryanston-place, W.*
- 1861 Lamont, James, Esq. 4, *Queen-street, Mayfair, W.*
- 1870 Lamplough, Charles Edward, Esq. *City of London Club, E.C.*
- 1866 Lampray, John, Esq. 16, *Camden-square, N.W.*
- 1864 Lampson, Sir C. M., Bart. 80, *Eaton-square, S.W.*
- 1859 Lange,\* Sir Daniel A. *Lanehurst, Abourne, Sussex.*
- 1856 Langler,\* John R., Esq., B.A. *Broxholme, Thurlow-hill, Lower Norwood, S.E.*
- 1871 Langworthy, Edward M., Esq. *Geys-house, Holyport, Maidenhead.*
- 1876 Lansdell,\* Rev. Henry. *The Grove, Blackheath, S.E.*
- 1861 Lardner, Colonel John. *United Service Club, S.W.*
- 1873 Large, Robert Emmott, Esq. *The Elms, Portsmouth-road, Surbiton; and 13, South-square, Gray's-inn, W.C.*
- 1859 Larnach, Donald, Esq. 21, *Kensington-palace-gardens, W.*
- 1870 Lassetter, Frederic, Esq. 5, *Porchester-gate, Hyde-park, W.*
- 1870 Laughton, Lieut.-Col. George Arnold (Bombay Staff Corps), Superintendent Bombay Survey, *Bombay.*
- 1869 C. Laughton, J. K., Esq. *Royal Naval College, Greenwich.*
- 1876 Laurie,\* Peter Geo., Esq. 9, *Arundel-gardens, Kensington-park, W.; Sulhamstead Abbots, near Reading, Berks; and Thatched-House Club, St. James's-street, S.W.*
- 1876 Lavies, Joseph Samuel, Esq. 96, *St. George's-road, S.W.*
- 1873 Law, Geo., Esq. 544, *Oxford-street, W.C.*
- 1846 Law,\* Hon. H. Spencer, M.A. 36, *Eccleston-square, S.W.*
- 1873 Law, Jas., Esq. 544, *Oxford-street, W.C.*
- 1874 Lawes,\* Robert Murray, Esq. 9, *Clarges-street, Piccadilly, W.*

Year of Election.	
1880	Lawes, Rev. William George. 3, <i>Donnington-road, Reading.</i>
1870	Lawrence, Alexander, Esq. <i>Clyde-house, Thurlow-road, Hampstead, N.W.; and 11, Great Winchester-street, E.C.</i>
1876	Lawrence, A. M., Esq., jun. 17, <i>Thurlow-road, Hampstead, N.W.</i>
1874	Lawrence, Fred. W., Esq. <i>Oakleigh, Beckenham, Kent.</i>
1876	Lawrence, Lord. 34, <i>Beaufort-gardens, S.W.</i>
1877	Lawrence, Sir J. J. Trevor, Bart., M.P. 9, <i>Prince's-gate, S.W.; and Burford-lodge, Dorking, Surrey.</i>
1870	Lawrence,* Philip Henry, Esq. 3, <i>Stone-buildings, Lincoln's-inn, W.C.</i>
1873	Lawrence, W. F., Esq. <i>New University Club, S.W.</i>
1868	Lawrie, James, Esq. 63, <i>Old Broad-street, E.C.</i>
1867	Lawson, William, Esq. 21, <i>Walham-grove, Fulham, S.W.</i>
1879	Laxton, Wm. Fredk., Esq., F.S.A. 4, <i>Essex-court, Middle-temple, E.C.; and Beaconsfield Club, Pall-mall, S.W.</i>
1862	Lay,* Horatio N., Esq., C.B. <i>Rumleigh, Tavistock, Devon.</i>
1857	6. C. p. Layard, Right Hon. Sir Austen H., G.C.B., D.C.L. <i>Athenæum Club, Pall-mall, S.W.</i>
1876	Layard, Capt. Brownlow E. <i>Horfield-barracks, Bristol.</i>
1866	Layard,* Captain Brownlow Villiers (3rd West India Regt.). <i>Junior United-Service Club; and 38, Upper Mount-street, Dublin.</i>
1863	Leaf,* Charles J., Esq. 6, <i>Sussex-place, Regent's-park, N.W.</i>
1875	Leake,* Sir Luke S., Knt. <i>Perth, Western Australia. Care of C. J. Wainwright, Esq., Elmhurst, East End, Finchley, N.</i>
1874	Leared, Jno., Esq. 12, <i>Old Burlington-street, W.</i>
1874	Learmonth, Andrew James L., Esq. <i>Junior United Service Club, S.W.</i>
1876	Learmonth, Thos. Livingstone, Esq. 45, <i>Gloucester-gardens, W.</i>
1873	Leaver, J. Christopher, Esq., <i>Rostherne-house, Castlenau, Barnes, Surrey.</i>
1866	Lebour, G. A., Esq., M.A., F.G.S. <i>College of Physical Science, Newcastle-on-Tyne.</i>
1853	Le Breton,* Francis, Esq. 21, <i>Sussex-place, Regent's-park, N.W.</i>
1861	Leckie, Patrick C., Esq. 7, <i>Palace-road, Roupell-park, Streatham, S.W.</i>
1870	Lecky, Capt. Squire Thornton Stratford (Royal Naval Reserve). <i>Forest-Edge, Sway, near Lymington, Hampshire.</i>
1880	Le Cièn, Henry, Esq. 107, <i>St. George's-square, S.W.</i>
1875	Lee, Rev. Albert. <i>Silk-hall, Tockholes, near Darwen, Lancashire.</i>
1868	Lee, John, Esq. <i>Grosvenor-cottage, Versailles-road, Anerley, S.E.</i>
1873	Lee, John Dunkin, Esq. <i>The Oaks, Belvedere-park.</i>
1874	Leeman, George, Esq. 7, <i>Dean's-yard, Westminster, S.W.</i>
1879	Lees, Charles Cameron, Esq., C.M.G. 19, <i>Pembroke-road, Kensington, W.</i>
1878	Lees, Eli, Esq. 102, <i>Lancaster-gate, W.</i>
1879	Lees, Lieut. Hastings Rowley, R.N. <i>H.M.S. 'Cambridge,' Plymouth.</i>
1869	Lees,* Lieutenant-Colonel Nassau, D.C.L. <i>Athenæum Club, S.W.</i>
1879	Lees, Robert Wilson, Esq.
1865	Le Feuvre, W. H., Esq., C.E.

Year of Election.		
1878		Lefroy, Anthony O'Grady, Esq., C.M.G. <i>Care of Mr. T. M. C. Vigo, 19, Abchurch-lane, E.C.</i>
1853	C. p.	Lefroy, General Sir John Henry, R.A., K.C.M.G., F.R.S., &c. 82, <i>Queen's-gate, S.W.; and Athenæum Club, S.W.</i>
1862		Leggatt, Clement Davidson, Esq. 1, <i>Pinner's-court, Old Broad-street, E.C.</i>
1861		Legh, William John, Esq., M.P. 38, <i>Belgrave-square, S.W.; and Lyme-park, Cheshire.</i>
1861		Lehmann,* Frederick, Esq. 15, <i>Berkeley-square, W.</i>
1845		Leigh, John Studdy, Esq., F.G.S. 107, <i>Hereford-road, Bayswater, W.</i>
1869		Leigh, Roger, Esq. <i>Barham-court, near Maidstone, Kent.</i>
1877		Leighton, Thomas, Esq. <i>The Limes, West Brixton, S.W.</i>
1863		Le Mesurier, Henry P., Esq., C.S.I., C.E. 21, <i>Stanley-crescent, Kensington-park, W.</i>
1878		Lepper, Chas. H., Esq. <i>Rookwood, Bradford, Yorkshire.</i>
1874		Le Pays, Geo. Renatus, Esq. 7, <i>Portland-terrace, Regent's-park, N.W.</i>
1880		Lesslie, Ralph, Esq. <i>Trinidad.</i>
1867		L'Estrange, Carleton, Esq. <i>Carlton Club, S.W.</i>
1876		Lethbridge, Edwin B., Esq. 42, <i>Coleman-street, Brighton.</i>
1873		Letts, Thomas, Esq. 72, <i>Queen Victoria-street, E.C.</i>
1876		Lever, J. O., Esq., M.P. 97, <i>St. George's-square, S.W.</i>
1857		Leverson, George B. C., Esq. 18, <i>Queensberry-place, Cromwell-road, S.W.</i>
1876		Leverson, Lieut. Julian Jno., R.E. 18, <i>Queensberry-place, Cromwell-road, S.W.</i>
1869		Leveson, Edward J., Esq. <i>Cluny, Crescent-wood-road, Sydenham-hill, S.E.</i>
1873	p.	Levi, Professor Leone, F.S.A., &c. 19, <i>Richmond-crescent, Barnsbury, N.; and 5, Crown Office-row, Temple, E.C.</i>
1874		Levin, Nathaniel, Esq. 44, <i>Cleveland-square, W.</i>
1859		Levinsohn, Louis, Esq. <i>Vernon-house, Clarendon-gardens, Maida-hill, W.</i>
1876		Levy, B. W., Esq. 19, <i>St. Helen's-place, E.C.</i>
1873		Lewin,* Frederick Dealtry, Esq. <i>Morelands, St. John's-park, Blackheath, S.E.</i>
1877		Lewin, F. Geo., Esq. 4, <i>Lombardian-villas, St. Mary's-road, Peckham, S.E.</i>
1869	p.	Lewin,* Col. Thomas H. (Beng. Staff Corps). <i>Garden-corner-house, Chelsea Embankment, S.W.</i>
1879		Lewis,* Edwd. Wm., Esq. <i>Beauesert, Leighton Buzzard.</i>
1876		Lewis, Francis T., Esq.
1872		Lewis, Jos., Esq., R.N. 25, <i>Duke-street, Grosvenor-square, W.</i>
1874		Lewis, Rev. R. C., M.A. <i>Streatham-common, S.W.</i>
1852	p.	Leycester, Captain Edmund M., R.N. <i>White-place, near Maidenhead, Berks.</i>
1876		Leyland, R. Watts, Esq. 17H <i>Exchange-buildings North, Liverpool.</i>
1859		Lichfield, Right Hon. Thomas George, Earl of. <i>Shugborough, Staffordshire.</i>
1878		Lienhardt, Chas. Eugene, Esq. 4, <i>East India-avenue, E.C.</i>
1856		Lilford, Thomas Lyttleton Powys, Lord. <i>Lilford-park, Oundle, Northamptonshire.</i>
1875		Lillingston, Lieutenant F. G. Innes, R.N. <i>Coilemore-house, Lochalsh, Ross-shire.</i>
1880		Lindley,* Robert Searles, Esq., C.E. 29, <i>Blüttersdorffs-platz, Frankfort-on-Maine.</i>
1860		Lindsay, H. Hamilton, Esq. 14, <i>Windham-place, Bryanston-square.</i>



Year of Election.	
1870	Lindsay, Lord, M.P. 47, <i>Brook-street, Grosvenor-square, W.</i>
1867	Lindsay,* Colonel Robert J. L., V.C., M.P. <i>Lockinge-house, Wantage, Berks; and 2, Carlton-gardens, S.W.</i>
1869	Lindsey, Mark John, Esq. 32, <i>Ludgate-hill, E.C.; and Burnt-ash-lane, Lee, Kent.</i>
1877	Lissa, Joseph Isaac Cohen de, Esq. <i>Port Louis, Mauritius.</i>
1875	Lister, Isaac S., Esq. <i>The Heath, Hampstead, N.W.</i>
1866	Little, Archibald J., Esq. <i>Shanghai; and 18, Park-street, Grosvenor-square, W.</i>
1871	Little, Simon, Esq. <i>Calantra-house, Wexford, Ireland.</i>
1876	Littledale, Clement St. George, Esq. <i>Highfield, near Liverpool.</i>
1870	Littleton, The Hon. Henry S. <i>Teddesley, Penkridge, Staffordshire.</i>
1875	Littleton, Hon. Wm. F.
1877	Liversidge, Archibald, Esq., F.G.S. &c. <i>Care of Messrs. Trübner and Co., 57, Ludgate-hill, E.C.</i>
1878	Lloyd, Alfred, Esq. <i>Bush-lane, Cannon-street, E.C.</i>
1875	Lloyd, Capt. C. Henry. <i>Care of Messrs. Jno. Jupp and Co., 113, Fenchurch-street, E.C.</i>
1874	Lloyd, Francis Aylmer, Esq. 2, <i>Saint Charles-square, Notting-hill, W.</i>
1857	Lloyd,* Hon. Geo. A. <i>Sydney, N. S.W.; and 3, George-yard, Lombard-street, E.C.</i>
1880	Lloyd,* Percy, Esq. <i>Garden-cottage, Lower Norwood, S.W.</i>
1864	Lloyd,* W., Esq. <i>Myood-house, Wednesbury, Staffordshire.</i>
1867	p. Lloyd, Rev. William V., M.A.
1861	Lluellyn, Major Richard. <i>Army and Navy Club, S.W.</i>
1869	Lluellyn, Major William R., R.A. <i>Plymouth.</i>
1877	Lobb,* John, Esq. <i>Dursley-villa, 16, Crawley-road, Victoria-park, E.</i>
1868	Lobley, James Logan, Esq., F.G.S. <i>New Athenæum Club, Suffolk-street, Pall-mall, S.W.</i>
1859	Loch, Henry Brougham, Esq. <i>Government-house, Isle of Man.</i>
1857	Loch, William Adam, Esq. 42, <i>Redcliffe-gardens, S.W.</i>
1874	Lock, Alfred G., Esq. 89, <i>Mostyn-road, Brixton, S.W.; and Roselands, Millbrook, Southampton.</i>
1864	Locke, John, Esq. 83, <i>Addison-road, Kensington, W.</i>
1858	p. Lockhart, William, Esq., F.R.C.S. 67, <i>Granville-park, Blackheath, S.E.</i>
1868	Lockhart, Captain Wm. Stephen Alexander.
1874	Loder,* Edmund Giles, Esq. 42, <i>Grosvenor-square, W.</i>
1880	Loewe, Siegmund, Esq. 3, <i>Oakley-road, Southgate-road, N.</i>
1872	Logan, Sir T. Galbraith, K.C.B., M.D. 40, <i>Hyde-park-square, W.</i>
1868	Lomonosoff, M. Alexis de. <i>Assist.-Sec. Geographical Society, St. Petersburg. Care of Messrs. Hamilton and Co., 32, Paternoster-row, E.C.</i>
1860	Londesborough, Wm. Henry Forester, Lord. 38, <i>Berkeley-square, W.</i>
1874	Long, Rev. James. 14, <i>Salisbury-square, Fleet-street, E.C.</i>
1857	Long,* W. Beeston, Esq.
1876	Longden, Major-General Henry Edward, C.B. 44, <i>Lower Leeson-street, Dublin; and United Service Club, S.W.</i>

Year of  
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- 1872 Longden, Sir J. R., K.C.M.G. *Government-house, Trinidad. Care of Mr. J. P. Martineau, 36, Theobald's-road, Bedford-row, W.C.*
- 1865 Longley,\* Lt.-Col. George, R.E. *Care of H. Longley, Esq., 8, Lowndes-street, S.W.*
- 1879 Longman, Charles J., Esq. *39, Paternoster-row, E.C.*
- 1870 Longstaff,\* Lieut.-Colonel Llewellyn Wood. *Ridgels, Wimbledon.*
- 1861 Lonsdale, Arthur Pemberton, Esq.
- 1860 Looker, William Robert, Esq. *Melbourne, Australia. Care of Mr. Ashhurst, 9, Fenchurch-street, E.C.*
- 1875 Lord, W. Barry, Esq. *Downshire-hill-cottage, Hampstead, N.W.*
- 1874 C. Lorne, The Most Hon. the Marquis of, K.T. *Canada.*
- 1876 Lort, William, Esq. *Fron Goch Hall, Llanllugan, Via Berriew, Montgomeryshire.*
- 1875 Lothian,\* Maurice Jno., Esq. *Woodcote-park, Blackshields, N. B.*
- 1864 Lothian, Most Hon. William Schomberg, Marquis of. *Newbattle-abbey, Dalkeith, N. B.*
- 1879 Louis, Julian A. H., Esq. *Winchester-cottage, Chancellor-road, West Dulwich.*
- 1873 P. Lovett, Lieut.-Colonel Beresford, R.E. *The Rectory, Pickwell, Oakham.*
- 1856 Lovett, Phillips Cosby, Esq. *Liscombe-house, Liscombe, Leighton Buzzard.*
- 1867 Low, Alex. F., Esq. *84, Westbourne-terrace, W.*
- 1875 Low, Chas. R., Esq. (Lieut. late I.N.) *82, Elsham-road, Kensington, W.*
- 1863 Low, S. P., Esq. *55, Parliament-street, S.W.*
- 1858 Lowden, Rev. George Rouse. *St. Leonard-villa, Hanwell, Middlesex.*
- 1859 Lowe, Captain W. Drury. *19, Portman-square, W.*
- 1879 Lowenstein, C., Esq. *Loughborough Grammar School, Loughborough, Leicestershire.*
- 1873 Lowther,\* Capt. Marcus, R.N. *Thornton, Ryde.*
- 1878 Loyd, Lieut. Lewis Vivian (Grenadier Guards). *16, Grosvenor-place, S.W.*
- 1870 Luard, Captain Charles Edward, R.E. *Portsmouth.*
- 1873 Luard, Major-General R. G. A. *8, Albert-villas, Clifton, Bristol.*
- 1866 Luard, Wm. Charles, Esq. *Llandaff-house, Cardiff; and Athenæum Club, S.W.*
- 1871 C. Lubbock,\* Sir John, Bart, M.P. F.R.S., &c. *High-elms, Beckenham, Kent.*
- 1879 Lucas, Alfred Walter, Esq. *Queen's-park, Chester.*
- 1876 Lucas,\* Arthur, Esq., C.E. *15, George-street, Hanover-square, W.*
- 1877 Luck, F. G., Esq. *The Olives, Wadhurst, Sussex.*
- 1879 Luck, Harry Courtenay, Esq. *138, Stamford-street, S.E.*
- 1875 Luckman, Alfred, Esq.
- 1871 Ludlow, Edgar John David, Esq. *Care of Geo. Perry, Esq., 67, Charleswood-street, St. George's-road, S.W.*
- 1873 Lugard, General Right Hon. Sir Edward, G.C.B. *10, Albert-place, Victoria-road, Kensington, W.*
- 1872 Lumsden,\* Colonel Sir P. S., K.C.B., C.S.I. (Quartermaster-General, Bengal Army). *United Service Club, Pall-mall, S.W.*
- 1860 Lumsden,\* Rev. R. C., M.A., F.R.A.S. *Maidenhead.*
- 1860 Lush, Hon. Sir Robert, Q.C. *Balmoral-house, Avenue-road, Regent's-park, N.W.*

Year of  
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1873		Lushington-Tilson,* Rev. W. R. Tilson Marsh, M.A. <i>Oxford and Cambridge Club, S.W.; Conservative Club, S.W.; and Stretham Manor, Isle of Ely,</i>
1877		Lutley, Robert George, Esq. <i>Care of Mrs. Lutley, 11, Baring-crescent, Exeter.</i>
1876		Luttrell,* Lieut. Alexander Fownes (Gren. Guards). <i>Guards' Club, Pall-mall, S.W.; and Dunster-castle, Somerset.</i>
1873		Lycett, Sir Francis, K.C.B. 18, <i>Highbury-grove, Highbury, N.</i>
1866		Lydall, J. H., Esq. 12, <i>Southampton-buildings, Chancery-lane, W.C.</i>
1873		Lydgate, Robert, Esq. <i>Upper School, Peckham, S.E.</i>
1873		Lydgate, Wm., Esq. <i>The Castle School, Guildford.</i>
1869		Lyell, John Gaunt, Esq. 14, <i>Kensington-gate, Hyde-park-south, W.</i>
1877		Lyell, Francis H., Esq. <i>St. Heliers, Bickley, Kent.</i>
1861	p.	Lynch,* Thomas Kerr, Esq. 31, <i>Cleveland-square, Hyde-park, W.</i>
1858		Lyne, Francis, Esq. 5, <i>Seagrave-place, Pittville, Cheltenham.</i>
1875		Lyne, Robt. E., Esq. <i>Royal Dublin Society, Dublin.</i>
1879		Lysons, General Sir Daniel, K.C.B. 92, <i>St. George's-square, S. W.</i>
1879		Maberley, Alf. Wm., Esq., C.E. <i>Exeter-hall, Strand, W.C.</i>
1877		Macalister,* James, Esq. 95, <i>Bishopsgate-street-within, E.C.</i>
1875		Macaulay, James, Esq. 7, <i>Albemarle-street, W.</i>
1863		Macbraire, James, Esq. <i>Broadmeadows, Berwick-on-Tweed.</i>
1876		Macdona, G. de Laudre, Esq. <i>Hilbre-house, West Kirby, Cheshire.</i>
1875		Macdonald,* James, Esq. 17, <i>Russell-square, W.C.</i>
1873		Macdonald, Colonel John (Beng. Staff Corps). <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S. W.</i>
1871		Macdonald, William, Esq. <i>Yokohama, Japan.</i>
1879		Macdonald, Major-General W. C. R., C.B. <i>United Service Club, Pall-mall, S.W.</i>
1877		Macdonald, Wm. M., Esq. <i>St. Martin's, Perth.</i>
1843	p.	Macdonnell, Sir Richard Graves, K.C.M.G., C.B. <i>Athenæum Club, Pall-mall, S.W.</i>
1865		Macfarlan, John G., Esq. <i>The Tower, Richmond-bridge.</i>
1876		Macfarlane, Donald, Esq., M.D. 17, <i>Westbourne-park, W.; and East India U. S. Club, St. James's-square, S.W.</i>
1874		Macfarlane, Donald H., Esq., M.P. 62, <i>Portland-place, W.</i>
1879		MacGregor, Alex., Esq., C.E. 6, <i>Charles-street, Berkeley-square, W.</i>
1868		MacGregor, Lieut.-Col. C. M., C.B.
1855		MacGregor, Duncan, Esq. <i>Athenæum Club, S. W.</i>
1872		MacGregor,* John, Esq., M.A. 7, <i>Vanbrugh-park East, Blackheath; and Athenæum Club, S. W.</i>
1879		Macintyre, Colonel Donald, V.C. <i>East India United Service Club, 14, St. James's-square, S. W.</i>
1845		Macintyre,* Patrick, Esq., F.S.A. 1, <i>Maida-vale, W.</i>
1859		Mackay, Rev. Alexander, LL.D. <i>Prospect-house, Grove-road, Ventnor, Isle of Wight.</i>

Year of  
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- 1870 Mackay, Nevile F., Esq. 3, *Salter's-hall-court, Cannon-street, E.C.*
- 1873 Mackelvie, Jas. Tannock, Esq. 21, *Victoria-st., S.W.*; and 7, *Albemarle-st., W.*
- 1877 Mackenzie, Capt. Colin (78th Highlanders). *Naval and Military Club, Piccadilly, W.*
- 1878 Mackenzie,\* Colin, Esq. *Care of Messrs. J. Bramley-Moore and Co., Liverpool.*
- 1880 Mackenzie,\* James T., Esq. *Hatchford, Cobham, Surrey.*
- 1873 Mackenzie, William, Esq., M.D., C.B. 2, *Gloucester-houses, Gloucester-crescent, S.W.*; and *East India United Service Club, S.W.*
- 1864 Mackeson,\* Edward, Esq. 13, *Hyde-park-square, W.*
- 1862 Mackinlay, D., Esq. *Oriental Club, W.*
- 1867 Mackinlay, John, Esq., J.P., M.I.C.E. *Percy-house, 15, Percy-circus, W.C.*
- 1878 Mackinnon,\* Rev. Donald Dimsdale, M.A. *New University Club, St. James's-street, S.W.*; and 8, *Montagu-street, Portman-square, W.*
- 1865 C. Mackinnon,\* W., Esq. *Tarbert, Lochfyne, Argyleshire*; and 7, *Lothbury, E.C.*
- 1872 Mackintosh, Alex, Esq. 9, *Talbot-square, Hyde-Park, W.*
- 1861 Mackintosh, Alexander Brodie, Esq. *Oriental Club, W.*; and *Dunoon, Scotland.*
- 1860 Mackirdy, Gen. Elliot (69th Regiment). *U. S. Club, S.W.*
- 1873 Mackley, Thomas Cole, Esq. 12, *Mark-lane, E.C.*
- 1871 MacLagan, Gen. Robert, R.E. 37, *Lexham-gardens, Kensington, W.*
- 1871 MacLaine, Murdoch G., Esq., of Lochbuy. *Oban, Scotland.*
- 1860 Maclean, William Crichton, Esq., F.G.S. 31, *Camperdown-place, Great Yarmouth.*
- 1859 MacLeay, Sir George, K.C.M.G. *Pendell-court, Bletchingley.*
- 1855 Maclure, Andrew, Esq. *Messrs. Maclure, Macdonald, and Macgregor, 97, Queen Victoria-street, E.C.*
- 1861 Maclure, John William, Esq. 4, *St. James's-place, S.W.*; and *The Home, Whalley-range, Manchester.*
- 1879 MacMahon, Colonel Charles. *Marlow-road, Kensington, W.*
- 1861 Macmillan, Alex., Esq. 1, *Bedford-street, Covent-garden, W.C.*
- 1874 MacMurdo, Lieut.-General, C.B. 36, *Queen's-gate-terrace, South Kensington.*
- 1871 Macnab, Duncan Macpherson, Esq. *Union Club, S.W.*
- 1874 Macnamara, Surg.-Maj. F. N., M.D. (Indian Army). 28, *Palace-gardens-terrace, W.*
- 1878 Macneill, Duncan, Esq. 7, *Lothbury, E.C.*
- 1870 Macturk, John, Esq. 8, *Hillhead-gardens, Glasgow.*
- 1878 McAlister, Alex., Esq. 242, *Richmond-road, Hackney.*
- 1873 McAlpin, Donald A. L., Esq., R.N. 1, *Llanion-terrace, Pembroke Dock, South Wales.*
- 1873 McAlpin, Kenneth W. A. G., Esq. *Llanion-terrace, Pembroke-dock, South Wales.*
- 1875 McAndrew, Maj.-Gen. G. (Bengal Staff Corps). *Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.*
- 1863 McArthur, Alex., Esq., M.P. *Raleigh-hall, Brixton-rise, Brixton, S.W.*
- 1867 McArthur, William, Esq., M.P. 1, *Gwydyr-houses, Brixton-rise, S.W.*
- 1872 McCall, John, Esq. *Care of J. Walker, Esq., 351, Brixton-road, S.W.*
- 1880 McCarthy, Desmond, Esq. *Lagos, West Coast of Africa.*

Year of Election.		
1879		McClatchie, H. Parkes, Esq.
1876		McClean, Rev. D. Stuart. <i>Norwood-rectory, Southall, Middlesex.</i>
1868		McClean, Frank, Esq., M.A., C.E. <i>Ferncliffe, Tunbridge Wells.</i>
1860	Ex. C. p.	McClintock, Admiral Sir Francis Leopold, F.R.S. <i>United Service Club, S.W.</i>
1879		McClintock, Capt. William, R.N. <i>Ordnance Factory, Enfield-lock, Middlesex.</i>
1871		McClure,* Joseph Henry, Esq. <i>Beaconsfield Club, Pall-mall, S.W.</i>
1876		McConnell, Jas. Edw., Esq., C.E. 2, <i>Dean's-yard, Westminster, S.W.</i>
1861		McConnell,* W. R., Esq. 12, <i>King's-Bench-walk, Temple, E.C.; and Charleville, Belfast.</i>
1862	P.	McCosh, John, Esq., M.D. <i>Junior United Service Club, S.W.</i>
1865		McEuen, D. P., Esq. 24, <i>Pembroke-square, Bayswater, W.</i>
1877		McEwan, John Thomas H., Esq. <i>Care of W. T. Ogden, Esq., 6A, Austin Friars, E.C.</i>
1874		McGavin, Alan Lawrie, Esq. <i>Cordon-lodge, Wanstead; and 2, Barge-yard, Victoria-street, S.W.</i>
1867		McGregor, Duncan, Esq. <i>Clyde-place, Glasgow.</i>
1869		McGrigor, Alexander Bennett, Esq. 19, <i>Woodside-terrace, Glasgow.</i>
1874		McIlwraith, Robert, Esq. 45, <i>Bedford-gardens, Campden-hill, W.</i>
1880		McIlwraith, Thomas, Esq. <i>Queensland. Care of Messrs. McIlwraith, McEachan and Co., 34, Leadenhall-street, E.C.</i>
1878		McKenna, Leopold, Esq. <i>Ravensbourne-park, Catford-bridge, S.E.</i>
1873		McKerlie, P. H., Esq., F.S.A. Scot., &c. 26, <i>Pembroke-villas, Bayswater, W.</i>
1867		McLean,* Hon. John. <i>Oamaru, New Zealand. Care of Messrs. Redfern, Alexander, and Co., 3, Great Winchester-street-buildings, E.C.</i>
1876		McLean,* Robert Allan, Esq., F.S.S. <i>Duart-house, The Avenue, Eltham-road, Lee, S.E.</i>
1874		McMahon, Colonel A. <i>Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>
1875		McMaster, James, Esq. 1, <i>Stanhope-gardens, Queen's-gate, S.W.</i>
1866		McNair, Major John F. A., R.A., C.M.G. <i>Care of Messrs. Codd and Co., 35, Craven-street, W.C.</i>
1839	C.	McNeil, The Right Hon. Sir John, G.C.B. <i>Burnhead, Liberton, Edinburgh.</i>
1876		McNeill, Colonel J. C., V.C., C.B. <i>United Service Club, Pall-mall, S.W.</i>
1873		McVean,* Colin A., Esq., <i>Care of Rev. D. McVean, Bunessan, Scotland.</i>
1875		Madan, Rev. J. R.
1872		Magrath, Colonel John R. (Madras Artillery, Ret.). <i>Murhill, near Bradford-on-Avon, Wilts; and East India U. S. Club, 14, St. James's-square, S.W.</i>
1877		Mair, G. J. J., Esq., F.S.A. 41, <i>Upper Bedford-place, Russell-square, W.C.</i>
1874		Maitland, Rev. A. Gray. <i>Woodford, Essex.</i>
1845	C. p.	Major,* Richard Henry, Esq., F.S.A. <i>Athenæum Club, S.W.; and British Museum, W.C.</i>
1868		Makins,* Henry F., Esq. 8, <i>Palace-gate, Kensington, W.; and Reform Club, S.W.</i>
1858		Malby, John Walter, Esq. 135, <i>Seven-sisters'-road, Holloway, N.</i>
1862		Malcolm,* Major Edward Donald, R.E. <i>Clifton-house, York.</i>
1843		Malcolm,* W. E., Esq. <i>Burnfoot, Langholme, near Carlisle.</i>

Year of Election.		
1876		Malden, B. Jno., Esq. 14, <i>Great Coram-street, Russell-square, W.C.</i>
1872		Malleson, Colonel G. B. 27, <i>West Cromwell-road, S. Kensington, S.W.</i>
1853		Mallet,* Chas., Esq. <i>Audit-office, W.C.; and 7, Queensbro'-terrace, Bayswater, W.</i>
1876		Maltby, F. Cecil, Esq. <i>Thatched-House Club, St. James's-street.</i>
1880		Man,* Edward Horace, Esq. <i>Port Blair, Andaman Islands.</i>
1877		Man, Maj.-Gen. Henry (Madras Staff Corps). 2, <i>Palace-road, Surbiton.</i>
1870		Man, Captain J. Alexander (Imperial Maritime Customs, China). <i>Junior United Service Club, S.W.</i>
1872		Man, Captain William. <i>Woodbridge, Suffolk.</i>
1872		Man, William, Esq. <i>Woodford, Essex.</i>
1874		Mann, H., Esq. <i>Belgrave-mansions, S.W.</i>
1860	p.	Mann, James Alexander, Esq., M.R.A.S.
1866	p.	Mann, Robert James, Esq., M.D. 5, <i>Kingsdown-villas, Wandsworth-common, S.W.</i>
1879		Mann, Rev. Thomas. <i>Sunnyside, Trowbridge, Wilts.</i>
1866		Manners, George, Esq., F.S.A. <i>Lansdowne-road, Croydon.</i>
1874		Manners-Sutton, Hon. Robert Henry. 12, <i>Queensberry-place, S. Kensington, S.W.</i>
1864		Mansell,* Captain A. L. <i>Chalus, Eubœa, Greece.</i>
1869		Mantell, Sir John Iles. <i>County Police-court, Strangeways, Manchester.</i>
1859		Mantell, Walter Baldock Durant, Esq. <i>Wellington, New Zealand. Care of A. J. Woodhouse, Esq., 1, Hanover-square, W.</i>
1873		Mantle, Wm. John, Esq. <i>The Grove, Lincoln.</i>
1869		March, Edward Bernard, Esq. (H.M. Consul, Callao). <i>Care of Messrs. King and Co., 45, Pall-mall, S.W.</i>
1871		Margetts, William G., Esq. 29, <i>Charleville-road, West Kensington, S.W.; and St. Stephen's Club, S.W.</i>
1872		Margöschis, John Thomas, Esq. <i>Care of Mrs. Margöschis, Brodie-villa, Leamington.</i>
1874		Marjoribanks, Edw., Esq., M.P. 134, <i>Piccadilly, W.</i>
1873	℄. p.	Markham, Captain Albert Hastings, R.N. 21, <i>Eccleston-square, S.W.</i>
1854	C. p.	Markham, Clements Robert, C.B., F.R.S. 21, <i>Eccleston-square, S.W.; and Athenæum Club, S.W.</i>
1877	p.	Marsh, Capt. H. C. <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1857		Marsh, Matthew Henry, Esq.
1879		Marshall,* Alfred, Esq. <i>Laurel-bank, Walthamstow, Essex.</i>
1876		Marshall, Horace Brooks, Esq. <i>Clifton-villa, Brixton.</i>
1862		Marshall,* J. G. Don, Esq. <i>Hurst-lodge, Twyford, Berks.</i>
1873		Marshall, John, Esq. <i>Auckland-lodge, Queen's-road, Richmond.</i>
1876		Marshall,* William, Esq. 37, <i>Norfolk-street, Strand, W.C.</i>
1859		Marsham,* The Hon. Robert. 5, <i>Chesterfield-street, Mayfair, W.</i>
1875		Marston, Edward, Esq. 188, <i>Fleet-street, E.C.</i>
1877		Marten, Chas. Henry, Esq. <i>Combe-lodge, Blackheath, S.E.</i>
1874		Marten, C. Rous, Esq. <i>Wellington, New Zealand.</i>

## List of Fellows of the

Year of Election.	
1871	Marten, Elliott, Esq. (Vice-Consul, <i>Sarawak</i> ). Care of W. T. Marten, Esq., 30, <i>Great St. Helen's, E.C.</i>
1861	Martin, Henry, Esq. <i>Sussex-house, Highbury-new-park, N.</i>
1860	Martin,* Richard Biddulph, Esq., M.P. <i>Chislehurst.</i>
1862	Martin, Thomas, Esq. <i>Beechwood, Withdean, near Brighton.</i>
1880	Mason, Lieut. A. H., R.E. 52, <i>Russell-square, W.C.</i>
1875	Mason, Dr. Samuel. 44, <i>Finsbury-circus, E.C.</i>
1871	Master, Chas. Hoskins, Esq. <i>Barrow-green-house, Oxted, near Godstone, Surrey.</i>
1870	Masterman, Edward, Esq. 30, <i>Threadneedle-street, E.C.</i> ; and 27, <i>Clement's-lane, Lombard-street, E.C.</i>
1870	Masterman, Edward, jun., Esq. 57½, <i>Old Broad-st., E.C.</i> ; and <i>Walthamstow.</i>
1869	Matheson,* Alexander, Esq., M.P. 38, <i>South-street, Park-lane, W.</i> ; and <i>Ardross-castle, Ross-shire, N. B.</i>
1874	Matheson,* Hugh Mackay, Esq. 3, <i>Lombard-street, E.C.</i>
1874	Mathews, Chas. Edward, Esq. <i>Oakgate, Augustus-road, Edgbaston, Birmingham</i> ; and <i>Arts Club, W.</i>
1880	Mathews, Gervais F., Esq. <i>Instow, North Devon.</i>
1872	Mathews, William, Esq. M.A. 60, <i>Harborne-road, Birmingham.</i>
1858	Mathieson, James Ewing, Esq. 77, <i>Lombard-street, E.C.</i> ; and <i>West-leath-lodge, Hampstead, N. W.</i>
1878	Maturin, Wm. Henry, Esq., c.B. 5, <i>Courtfield-gardens, South Kensington, S. W.</i>
1873	Maude, Colonel G. A. <i>Royal Mews, Pinkico, S. W.</i>
1875	Maudslay, Athol, Esq.
1875	Maule, Geo. Norman, Esq. 1, <i>Hare-court, Temple, E.C.</i> ; and <i>University Club, S. W.</i>
1872	Maxwell, John, Esq. <i>Lichfield-house, Richmond.</i>
1879	Maxwell, Major Robert James. 35, <i>Thurloe-square, S. W.</i>
1855	p. May, Staff-Commr. Daniel John, R.N. Care of Messrs. Case and Loudensack, 1, <i>James-street, Adelphi, W.C.</i>
1879	May, Rev. J. C., <i>Sierra Leone.</i> Care of J. R. Langler, Esq., <i>Brozholme, Thurlow-hill, Lower Norwood, S.E.</i>
1876	May, Wm., Esq. <i>St. Mary Cray, Kent.</i>
1858	Mayer, Joseph, Esq., F.S.A. 68, <i>Lord-street, Liverpool.</i>
1862	p. Mayne, Rear-Admiral Richard Charles, c.B. 101, <i>Queen's-gate, S. W.</i>
1858	Mayo, Captain John Pole. <i>Army and Navy Club, S. W.</i>
1867	Mayson, John S., Esq., J.P. 5, <i>St. James's-square, Manchester.</i>
1863	Meade, The Hon. Robert Henry. <i>Colonial-office, S. W.</i> ; and 32, <i>Belgrave-square, S. W.</i>
1874	Meadows, Dr. Alfred. 27, <i>George-street, Hanover-square, W.</i>
1875	Meakin, Edw. E., Esq. <i>Rosenfels, Red-hill, Surrey</i> ; and 22, <i>Fenchurch-street, E.C.</i>
1879	Means, Rev. Dr. J. O. (Secretary of American Board of Foreign Missions). <i>Beacon-street, Boston, U.S.A.</i>

Year of Election.		
1872		Measom, George Samuel, Esq. <i>St. Margaret's, Twickenham.</i>
1871	P.	Medhurst, Sir Walter H., Knt. <i>Athenæum Club, S.W.</i>
1862		Medlycott,* Commander Mervyn B., R.N. <i>Care of Messrs. Woodhead and Co. 44, Charing-cross, S.W.</i>
1876		Meiggs,* John G., Esq. 19, <i>Great Winchester-street, E.C.</i>
1874		Meinertzhagen,* Daniel, Esq. 10, <i>Rutland-gate, S.W.</i>
1854		Melvill, Major-General Sir Peter Melvill. 27, <i>Palmeira-square, Brighton.</i>
1838		Melvill, Philip, Esq., F.R.A.S. <i>Ethy-house, Lostwithiel, Cornwall.</i>
1877		Mendel, Samuel, Esq. <i>Chislehurst, Kent.</i>
1875		Menzies, Jas. Irvine, Esq. 76, <i>Stamford-street, S.E.</i>
1875		Mercer, Thomas, Esq. <i>Uxbridge.</i>
1868	C.	Merewether, Colonel Sir William Lockyer, K.C.S.I., C.B. 31, <i>Linden-gardens, Kensington, W.; and India-office, S.W.</i>
1871		Merritt,* Douglas, Esq. <i>Leacote, Rhinebeck, New York. Care of H. L. Sherlock and Sons, 9, Canning-place, Liverpool.</i>
1866		Messiter, Charles A., Esq. <i>Barwick-house, near Yeovil, Somerset.</i>
1871		Messum, Josiah Young, Esq., R.N., F.R.A.S. (Controller of H.M.'s Packet Services). <i>General Post-office, E.C.; and Bedford-villa, Sydenham-road, Croydon.</i>
1867		Metcalfe, Frederic Morehouse, Esq. <i>Wisbech, Cambridgeshire.</i>
1874		Methuen, Capt. Hon. Paul (Scots Fusilier Guards). <i>Guards' Club, Pall-mall, S.W.</i>
1871		Methven, Captain Robert. 54, <i>Scarsdale-villas, Kensington, W.</i>
1837		Mexborough,* Right Hon. John Chas. Geo., Earl of. 33, <i>Dover-street, W.; and Methley-park, near Leeds.</i>
1865		Michell,* General J. E., R.H.A. <i>Care of Mrs. Busch, 45, South Audley-street, W.</i>
1879		Michell, R. H., Esq. 150, <i>The Grove, Hammersmith.</i>
1863	P.	Michie,* A., Esq. 1, <i>Jeffreys-square, St. Mary Axe, E.C.</i>
1873		Michie, Sir Archibald, Q.C., K.C.M.G. 8, <i>Victoria-chambers, Victoria-street, S.W.; and Reform Club, S.W.</i>
1848		Middleton, Rear-Admiral Sir G. N. Broke, Bart. <i>Shrubland-park, Needham, Suffolk; and 35, Albemarle-street, W.</i>
1870		Midwinter,* William Colpoys, Esq. <i>Junior Carlton Club, Pall-mall, S.W.</i>
1868		Miers,* John William, Esq., C.E. 74, <i>Addison-road, Kensington, W.</i>
1879		Miles, Capt. H. S. G. (108th Regiment). <i>Naval and Military Club, Piccadilly, W.</i>
1872	P.	Miles, Lieut.-Col. Samuel Barrett (Bombay Staff Corps), H.M. Consul-General, <i>Baghdad. Care of Mrs. Miles, 8, Edgar-road, Winchester.</i>
1876		Miller, Chas. A. D., Esq. <i>Sherbrooke-lodge, Brixton, S.W.</i>
1874		Miller, Rear-Admiral David. <i>United Service Club, Pall-mall, S.W.</i>
1861		Miller,* Captain Henry Matthew, R.N. <i>United Service Club, S.W., and Fernside, Sevenoaks.</i>
1868		Miller, Robert Montgomerie, Esq. <i>Culverden-grove, Tunbridge Wells.</i>
1853		Miller,* Admiral Thomas. <i>United Service Club, S.W.</i>
1861		Milligan, Joseph, Esq. 6, <i>Craven-street, Strand, W.C.</i>



Year of Election.		
1857		Mills, Arthur, Esq. 34, <i>Hyde-park-gardens</i> , W.
1880		Mills, Capt. Charles, C.M.G. <i>Cape Town</i> ; and <i>Wanderer's Club</i> , <i>Pall-mall</i> , S.W.
1880		Mills, Frederick Charles, Esq. <i>Oxford and Cambridge Club</i> , S.W.; and 106, <i>Jermyn-street</i> , S.W.
1877		Mills, Jno. Elliott, Esq. <i>Care of W. H. Plaister, Esq., The Sycamores, High-road, Tottenham.</i>
1877		Millward, Victor, Esq., J.P. <i>Fair View, Redditch, Worcestershire.</i>
1860		Milman, Lieut.-Col. Everard S., Governor H.M.'s Prison, <i>Holloway, N.</i>
1866	C.	Milne, Admiral Sir Alex., Bart., G.C.B. 1, <i>Lowndes-street</i> , S.W.; and <i>Inveresk, Musselburgh.</i>
1879		Milne, J. V., Esq. <i>Henley-house, Mortimer-road, Kilburn, N.W.</i>
1867		Milner, Rev. John, B.A. <i>The Rectory, Middleton-in-Teesdale, Darlington.</i>
1872		Mitchell, William Aug., Esq. <i>Boscobel, Park-place, Leyton.</i>
1874		Mitford, Col. Jno. Philip Osbaldeston. <i>Mitford Castle, Morpeth, Northumberland</i> ; and <i>Army and Navy Club</i> , S.W.
1879		Moberly, Major-General Francis John, R.E. 50, <i>Sutherland-gardens, Harrow-road, W.</i>
1851		Mocatta,* Frederick D., Esq. 9, <i>Connaught-place, W.</i>
1873	P.	Moffat,* Rev. Dr. Robert. <i>Park-cottage, Leigh, Tunbridge, Kent.</i>
1879		Moffat, Robt. Jno., Esq. <i>Great Shelford, Cambridgeshire.</i>
1873		Moleyns, Major T. A. de, R.A. 53, <i>Seymour-street, Portman-square, W.</i>
1879		Möller, Ole Peter, Esq. 15, <i>The Terrace, Blackheath.</i>
1879		Moloney, Capt. A. C. <i>Care of Messrs. Cox and Co., Craig's-court, S.W.</i>
1876		Molynaux, Major W. C. F. 3rd <i>Brigade Office, Aldershot</i> ; and <i>Junior United Service Club, S.W.</i>
1870		Moneta, Don Pompeo, C.E.
1877		Money, Lieutenant-Colonel Gerard Noel (Bengal Staff Corps). <i>Stodham-park, Petersfield. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1871		Montagu, Jno. M. P., Esq. <i>Downe-hall, Bridport, Dorset, and Union Club, S.W.</i>
1862		Montague,* Lieut.-Colonel Horace. 6A, <i>Waterloo-place, S.W.</i>
1880		Montefiore, Jacob, Esq. 35, <i>Hyde-park-square, W.</i>
1830		Montefiore,* Sir Moses, Bart., F.R.S., F.R.S.N.A. 7, <i>Grosvenor-gate, Park-lane, W.</i> ; and <i>East-cliff-lodge, Ramsgate.</i>
1876		Montgomery, Jno. B. H., Esq. 33, <i>Mount-street, Grosvenor-square, W.</i>
1878		Montgomery, Percy Hugh Seymour, Esq. <i>Grey Abbey, Ireland.</i>
1860		Montgomery, Robert Mortimer, Esq. 3, <i>Porchester-place, Oxford-square, W.</i>
1865		Montgomery, Sir Robert, G.C.S.I., K.C.B. 7, <i>Cornwall-gardens, Queen's-gate, S.W.</i>
1874		Moodie, G. P. Esq. <i>Care of J. J. Pratt, Esq., 79, Queen-street, Cheapside, E.C.</i>
1839		Moody, General R. C., R.E. <i>Caynham-house, near Ludlow, Shropshire.</i>
1857		Moor,* Rev. Allen P., M.A., F.R.A.S. <i>St. Clement's-vicarage, Truro.</i>
1874		Moore, Adolphus W., Esq. <i>India-office, S.W.</i>
1861		Moore, John Carrick, Esq., F.R.S. <i>Corswall, Wigtonshire</i> ; and 113, <i>Eaton-square, S.W.</i>
1870		Moore, John, Esq.

Year of  
Election.

- 1870 Moore,\* Joseph, Esq. *Rydal-mount, Champion-hill.*
- 1880 Moorhead, A. B., Esq. 8, *Storey's-gate, S.W.*
- 1878 Morant, John H., Esq., C.E. 10, *Victoria-terrace, Weymouth.*
- 1872 Morant,\* Major J. L. L. (R. Mad. Eng.). *Mountstuart, Ootacamund, Neilgherries, Madras Presidency. Care of Messrs. John Gladding and Sons, 28A, Pater-noster-row, E.C.*
- 1863 More, R. Jasper, Esq. *Linley-hall, Salop.*
- 1869 p. Morgan,\* Delmar, Esq. 15, *Roland-gardens, South Kensington, S.W.*
- 1864 Morgan, D. L., Esq. (Deputy Inspector-General, R.N.).
- 1861 Morgan, Junius Spencer, Esq. 13, *Prince's-gate, Hyde-park, S.W.*
- 1866 Morland,\* Lieut. Henry, late L.N.
- 1839 Morris,\* Charles, Esq.
- 1871 Morris, Edw. Ellis, Esq. *Care of H. Morris, Esq., Eastcote-house, St. John's-park, Blackheath, S.E.*
- 1877 Morris, Edward S., Esq. *Wanderers' Club, Pall-mall, S.W.; and Pontamman, Cross Inn, Carmarthenshire.*
- 1871 Morrison,\* Alf., Esq. 16, *Carlton-house-terrace, S.W.*
- 1863 Morrison, Colonel J. C. D. *United Service Club, Pall-mall, S.W.*
- 1867 Morrison, Pearson, Esq. *Care of John Hockin, Esq., 8, Tokenhouse-yard, Lothbury, E.C.*
- 1865 Morson, Thomas, Esq. 124, *Southampton-row, Russell-square, W.C.*
- 1876 Mortimore, Foster, Esq. 78, *Eccleston-square, S.W.*
- 1873 Mosenthal, Adolph, Esq. 23, *Pembridge-square, W.*
- 1869 Moser, Robert James, Esq. 45, *Bedford-square, W.C.*
- 1877 Moses, Marcus Tertius, Esq. *Eberton-Leison-park; and 11, Eustace-street, Dublin.*
- 1869 Mott, F. T., Esq. 1, *De Montfort-street, Leicester.*
- 1879 Mott, Marcus William, Esq. *Oriental Club, Hanover-square, W.*
- 1861 p. Mouat,\* Frederick J., Esq., M.D. (Surgeon-Major and Inspector-General of Prisons, Bengal Army, &c.). 12, *Durham-villas, Kensington, W.; and Athenæum Club, S.W.*
- 1868 Mounsey,\* Aug. Henry, Esq. (British Legation, Yedo.) *Care of R. H. Mounsey, Esq., Castle-street, Carlisle.*
- 1871 Mowatt,\* James, Esq., M.A. 5, *Notting-hill-square, W.; and Caius College, Cambridge.*
- 1880 Moxon, Henry James, Esq. 9, *Compton-terrace, Highbury, N.*
- 1871 Mozley,\* H. W., Esq., M.A. *Eton College.*
- 1858 Mudie, Charles Edward, Esq. *Muswell-hill.*
- 1858 p. Mueller, Sir Ferdinand, K.C.M.G., M.D., PH.D. *Director of the Botanical Gardens, Melbourne. Care of Messrs. Dulau and Co., 37, Soho-square, W.*
- 1878 Muggerridge, W. H. Esq. *Bathurst, Devonshire-road, Wandsworth-road, S.W.*
- 1874 Muir,\* Hugh B., Esq. 26, *Old Broad-street, E.C.*
- 1867 Muir,\* Thomas, Esq. *Madeira; and 24, York-terrace, Regent's-park, N.W.*
- 1877 Mullens,\* Josiah, Esq. 34, *Hunter-street, Sydney, New South Wales. Care of Messrs. Browne, 263, Metropolitan Market, E.C.*

Year of Election.		
1876		Mulliner, Robt. Bouverie, Esq. <i>Grove-house, Grove-park, Chiswick.</i>
1875		Munro, Dr. 11, <i>Park-lane, W.</i>
1873		Münster, His Excellency Count (Ambassador of the German Empire). <i>German, Embassy, 9, Carlton-house-terrace, S.W.</i>
1869		Munton, Francis Kerridge, Esq. <i>Gloucester-house, Stonebridge-park, Willesden, N.W.</i>
1866		Murchison,* John H., Esq. <i>Junior Carlton Club, S.W.</i>
1859	C.	Murchison, Kenneth R., Esq. 24, <i>Chapel-street, Park-lane, W.; and Brocke-hurst, East Grinstead, Sussex.</i>
1830	C.	Murdoch,* Sir Thomas W. Clinton, K.C.M.G. 8, <i>Park-street, Westminster, S.W.; and 88, St. George's-square, S.W.</i>
1878		Murray, A. H. Hallam, Esq., B.A. 50, <i>Albemarle-street, W.</i>
1872		Murray,* G. S. D., Esq. 118, <i>Pall-mall, S.W.</i>
1868		Murray,* Henry, Esq. <i>Garrick Club, Garrick-street, W.C.</i>
1830	C.	Murray, John, Esq. 50, <i>Albemarle-street, W.; and Newstead, Wimbledon, S.W.</i>
1872		Murray,* John, jun., Esq. 50, <i>Albemarle-street, W.; and Newstead, Wimbledon, S.W.</i>
1876		Murray, Lieut. John Geo., R.A. <i>Lisnamaudre, Crossdoney, Ireland.</i>
1870		Murray, T. Douglas, Esq. 34, <i>Portland-place, W.</i>
1860		Murray,* Major W. G. (Beng. Staff Corps). <i>Care of Messrs. Sewell and Crouther, 18, Cockspur-street, S.W.; and Portigliolo, Ajaccio, Corsica.</i>
1870		Murray, William Vaughan, Esq., M.R.I., &c. 4, <i>Westbourne-crescent, Hyde-park, W.</i>
1876		Nagaoka, M. J., Esq. <i>Care of M. Nagasaki, Esq., 9, Kensington-park-grdns., W.</i>
1876		Nahishima,* N. H., Esq. <i>Care of M. Nagasaki, Esq., 9, Kensington-park-gardens, W.</i>
1865		Nairne, P. A., Esq. 2, <i>Grove-hill, Camberwell, S.E.</i>
1868		Napier of Magdala, Rt. Hon. Lord, G.C.B., G.C.S.I., F.R.S. <i>Care of Messrs. Coutts and Co., Strand.</i>
1876	p.	Napier, Major Hon. Geo. 21, <i>Grosvenor-street, W.</i>
1861		Napier, William, Esq.
1871	6. p. C.	Nares, Captain Sir George S., R.N., K.C.B. 23, <i>St. Philip's-road, Surbiton.</i>
1875		Needham, S. H., Esq., F.G.S. 5, <i>Mecklenburg-street, Mecklenburg-square, W.C.</i>
1873		Nelson, George Henry, Esq. <i>Wyggeston's Hospital Boys' School, Leicester.</i>
1857		Nesbitt,* Henry, Esq. 12, <i>Victoria-villas, Kilburn, N.W.</i>
1875		Nesbitt, William, Esq. <i>Junior Carlton Club, Pall-mall, S.W.</i>
1869		Neville, Lieut.-Col. Edward. 6, <i>Bolton-gardens, South Kensington, S.W.</i>

Year of  
Election.

1879		Newall, Major-General David J. F. <i>Beldorine-tower, Ryde, Isle of Wight.</i>
1870		Newall, Wm. Johnstone, Esq. 6, <i>South-street, Park-lane, W.</i>
1868		Newbatt, Benjamin, Esq., F.S.S., &c. 7, <i>Vicarage-gardens, Campden-hill, W.</i>
1876		Newby, Edwin H., Esq. <i>Chatham-buildings, New-bridge-street, E.C.</i>
1867		Newdigate, Lieut.-Col. Francis W. (Coldstream Guards). 26, <i>Seymour-street, W.; and Byrkley-lodge, Needwood Forest, Burton-upon-Trent.</i>
1876		Newman, Geo. G., Esq. 75 and 76, <i>Cornhill, E.C.</i>
1856		Newman, Thomas Holdsworth, Esq. 9, <i>Gt. Cumberland-place, Hyde-park, W.</i>
1873		Newton, Alfred P., Esq. 15, <i>Sheffield-gardens, Campden-hill, W.</i>
1872		Newton, Wm., Esq. 11, <i>Mitre-court, Temple, E.C.</i>
1870		Nicholas, W., Esq. <i>The Drive, Walthamstow.</i>
1870		Nicholl, Henry John, Esq. 16, <i>Hyde-park-gate, W.</i>
1865		Nichols,* Robert C., Esq. 5, <i>Sussex-place, W.</i>
1856	C. p.	Nicholson, Sir Charles, Bart., D.C.L. <i>The Grange, Totteridge, Herts, N.</i>
1875		Nicholson, Robert, Esq. <i>Loan End-house, Norham, near Berwick-on-Tweed, Northumberland.</i>
1868		Nicol, Geo. Wm., Esq. 312, <i>South Lambeth-road, S. W.</i>
1869		Nicol,* Robert, Esq. <i>Reform Club, S. W.; and Westminster-palace-hotel, S. W.</i>
1877		Nicolle, Wm., Esq., M.A. 107, <i>Lansdowne-road, Notting-hill, W.</i>
1871		Nicols, Arthur Robert, Esq. 11, <i>Church-row, Hampstead, N. W.</i>
1836		Nicolson, Vice-Admiral Sir Frederick Wm. Erskine, Bart., C.B. 15, <i>William-street, Lowndes-square, S. W.</i>
1878		Nightingale, Percy, Esq. 29, <i>St. James'-road, Tunbridge-wells.</i>
1858		Nix, John H., Esq. 77, <i>Lombard-street, E.C.</i>
1874		Noldwritt,* Jno. Spencer, Esq. 44, <i>Benhill-road, Brunswick-square, Camberwell, S.E.</i>
1857		Nolloth,* Admiral Matthew S. A 12, <i>Albany, Piccadilly, W.; and United Service Club, S. W.</i>
1876		Norman, Capt. Charles B.
1865		Norman, H. J., Esq. 4, <i>Halkin-street, Grosvenor-place, S. W.</i>
1877		Norman, Lieut.-General Sir H. W., K.C.B. 27, <i>Lezham-gardens, Cromwell-road, S. W.</i>
1876		Normandy, Frank, Esq.
1872		Norris, Charles, Esq. 124, <i>Wood-street, E.C.; and Marischal-road, Lee, Kent.</i>
1860		Norris, Harry, Esq. 38, <i>St. James's-place, S. W.</i>
1878		Norris, John, Esq. <i>Tanshelf-house, Pontefract.</i>
1861		North, Alfred, Esq. 23, <i>Lansdowne-crescent, Notting-hill, W.</i>
1879	PRES.	Northbrook,* Thos. Geo. Baring, Earl of, G.C.S.I., D.C.L., &c., &c. 4, <i>Hamilton-place, W.; and Brooks's Club, St. James's-street, S. W.</i>
1865		Northumberland, Algernon George, Duke of. 2, <i>Grosvenor-place, S. W.</i>

Year of Election.		
1875		Norton, Geo., Esq., M.A. 22, <i>Great George-street, S.W.</i>
1877		Norton, Henry Turton, Esq., M.A. 33, <i>Cornwall-gardens, Queen's-gate, S.W.</i>
1862		Notman, Henry Wilkes, Esq. <i>Cholmley-lodge, West-end, Kilburn, N.W.</i>
1862		Nourse, Henry, Esq. <i>Athenæum Club, S.W.</i>
1879		Oakes, William John, Esq. 54, <i>Leven-street, Westminster-road, Liverpool.</i>
1875		Oates, Wm. Edward, Esq. <i>Meanwoodside, near Leeds.</i>
1858		Ogilvie, Edward D., Esq. <i>Yulgillar, Clarence-river, New South Wales.</i>
1875		Ogilvie, Geo. M., Esq. 14, <i>St. James's-square, S.W.; and Raleigh Club, Regent-street, S.W.</i>
1877		O'Halloran, Joseph Sylvester, Esq. 1, <i>Whitehall-gardens, S.W.</i>
1876		O'Keeffe,* Commr. Yelverton, R.N. 14, <i>Avington-grove, Penge, S.E.</i>
1873		Older, W. Aug., Esq. <i>Carrington-lodge, Richmond.</i>
1861		Oldershaw, Capt. Robert Piggott. <i>St. Leonard's-lodge, Bedford-park, Croydon.</i>
1874		Oldham, Surgeon-Major C.F. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1870		Oldham, Henry, Esq., M.D. 4, <i>Cavendish-place, W.</i>
1855	C. p.	Oliphant, Laurence, Esq. <i>Athenæum Club, S.W.</i>
1878		Oliver, George, Esq. 10, <i>Mincing-lane, E.C.</i>
1866	p.	Oliver, Capt. S. P., R.A. 2, <i>Eastern-villas, Anglesey, Gosport, Hants; and Scientific Club, 7, Savile-row, W.</i>
1879		Olsen, Ole Theodor, Esq. 40, <i>Cleethorpe-road, Grimsby.</i>
1877		Ommanney, Major Edward Lacon (Bengal Staff Corps). <i>Woodville-house, Shooter's-hill-road, Blackheath, S.E.</i>
1845	C. p.	Ommanney,* Admiral Sir Erasmus, C.B., F.R.S., F.R.A.S. <i>The Towers, Yarmouth, Isle of Wight; and United Service Club, S.W.</i>
1867		Ormathwaite, John Benn-Walsh, Lord. 28, <i>Berkeley-square, W.</i>
1873		Ormerod,* Henry Mere, Esq. <i>Broughton-park, Manchester.</i>
1873		Orpen, F. H. S., Esq. <i>Barkly, Griqualand West; care of Messrs. Savage and Hill, Palmerston-buildings, Bishopsgate-street, E.C.</i>
1875		Orred, Chas. F. d'Angers, Esq. 4, <i>Albert-mansions, Victoria-street, S.W.</i>
1853		Osborn, Sir George R., Bart. <i>Travellers' Club, S.W.; and Chicksand-priory, Beds.</i>
1861		Osborne,* Lieut.-Col. Willoughby (Political Agent, <i>Bhopal, Schira, India</i> ).
1875		Osbourne, Jno. Smyth, Esq., jun. <i>Heath-house, Stapleton, Bristol.</i>
1852	C.	Oswell, William Cotton, Esq. <i>Groombridge, Kent.</i>
1877	p.	Otter, Baron Frederic von (Minister of Marine). <i>Care of Mr. Thorsten Nordenfelt, 1, St. Swithin's-lane, E.C.</i>
1874		Overall, Wm. Henry, Esq., F.S.A. <i>Guildhall, E.C.</i>
1870		Overbeck,* Baron de. <i>Hong-Kong. Care of Messrs. King and Co., 65, Cornhill, E.C.</i>

Year of Election.		
1844	C.	Overstone,* Samuel, Lord, M.A., M.R.I. 2, <i>Carlton-gardens, S.W.; and Wickham-park, Surrey.</i>
1873	p.	Oxenham, Edward Lavington, Esq. <i>Nutcombe-house, Weybridge, Surrey.</i>
1875		Oxley, Fredk., Esq. 23, <i>Gloucester-crescent, Hyde-park, W.</i>
1868		Owden, Sir Thomas S., Knt. <i>Mount-pleasant, Philip-lane, Tottenham.</i>
1874		Packe, William, Esq. 1, <i>Cavendish-square, W.</i>
1879		Paddon,* Jno., Esq. <i>Barkly, Griqualand West. Care of Messrs. Savage and Hill, Palmerston-buildings, Bishopsgate-street, E.C.</i>
1873		Page, George Gordon, Esq., C.E. 4, <i>Great James-street, Gray's-inn, W.C.</i>
1878		Page, Henry, Esq. <i>Dulwich-common, S.E.</i>
1877		Page, Wm. Irving, Esq. <i>Wimbledon-common, S.W.</i>
1878		Paine, Geo. Wm., Esq. <i>Cotswood-lodge, Farquhar-road, Dulwich-wood-park, Upper Norwood.</i>
1878	C. p.	Palgrave, W. Gifford, Esq. <i>Care of Messrs. H. S. King and Co., Cornhill, E.C.</i>
1876		Pallett,* Robt. Hy. Chas., Esq. <i>Theydon-hall, Theydon Bois, Essex.</i>
1880		Palmer, Charles James, Esq. 5, <i>Mornington-villas, Wanstead-park.</i>
1879		Palmer, George, Esq. 58, <i>Ebury-street, S.W.</i>
1865		Palmer,* Captain George, R.N. <i>Midgard, Hawick, Roxburghshire.</i>
1870	p.	Palmer,* John Linton, Esq., Surg. R.N. 24, <i>Rock-park, Rockferry, Cheshire.</i>
1872		Palmer, Rev. Joseph, B.A., &c. <i>Wells, Somerset.</i>
1873		Palmer, J. Horsley, Esq. 56, <i>Cromwell-road, Queen's-gate, S.W.</i>
1838		Palmer,* Samuel, Esq.
1869		Palmer,* T. G. A., Esq. 5, <i>Paper-buildings, Inner Temple, E.C.</i>
1870		Pannel, Charles S., Esq. <i>Walton-lodge, Torquay.</i>
1865		Papengouth,* Oswald C., Esq., C.E. <i>Care of W. Hornibrook, Esq., 6, Regent's-square, W.C.</i>
1863		Paris,* H.R.H. le Comte de.
1876		Parish,* Chas. Woodbine, Esq. <i>Quarry-house, St. Leonards-on-Sea.</i>
1849		Parish,* Admiral John E., R.N. 6, <i>Bina-gardens, S.W.</i>
1833	C. p.	Parish,* Sir Woodbine, K.C.H., F.R.S., &c. <i>Quarry-house, St. Leonards-on-Sea.</i>
1874		Park, Abraham, Esq. <i>Warrington-terrace, Ashton-under-Lyne; and Morningdale-house, Renfrewshire, N. B.</i>
1873		Park, James Dickson, Esq. 48, <i>Queen's-gate-gardens, South Kensington, S.W.</i>
1866		Parker, Capt. Francis G. S. (54th Regiment), F.G.S., A.I.C.E. <i>Westbere-house, Sturry, near Canterbury.</i>
1875		Parker,* Honourable Francis. 94, <i>Eaton-square, S.W.; and 9, King's-Bench-walk, Temple, E.C.</i>
1873		Parker, James, Esq. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1850	p.	Parkes, Sir Harry S., K.C.B. (H.M. Minister Plenipotentiary, &c., in Japan). 61, <i>Rutland-gate, S.W.</i>
1873		Parkin, George Lewis, Esq. 22, <i>Park-lane, W.</i>

Year of Election.		
1877		Parkin, Thomas, Esq., M.A. 29, <i>Boulevard Haussmann, Paris. Care of Rev. John Parkin, Halton-vicarage, Hastings.</i>
1850	C. p.	Parkyn,* Mansfield, Esq., F.Z.S. <i>Arthur's Club, St. James's-street, S.W.</i>
1876		Parlane, Jas., Esq. <i>Appleby-lodge, Rusholme, Manchester.</i>
1877		Parr, Commander Alfred A. Chase, R.N. <i>Powys-lodge, Bickley, Kent.</i>
1872		Parry, Edward, Esq. 290, <i>Camden-road, N.W.</i>
1872	P.	Parry,* Francis, Esq. 2, <i>Stanhope-gardens, Cromwell-road, S.W.</i>
1880		Parsons, Philip, Esq. 2, <i>Clyde-villas, Croxted-road, Dulwich.</i>
1873		Pasco, Captain Crawford, R.N. <i>Care of Messrs. Case and Loudensack, 1, James-street, Adelphi, W.C.</i>
1874		Pass, Elias A. de, Esq. <i>The Lodge, Bembridge, Isle of Wight.</i>
1859		Pasteur, Marc Henry, Esq. 38, <i>Mincing-lane, E.C.</i>
1867		Paterson, John, Esq. 7 and 8, <i>Australian-avenue, E.C.</i>
1871		Patterson, Jas. Wilson, Esq. <i>Roseland, Waverley, Baltimore Co., U.S.A. Care of Messrs. Brown, Shipley and Co., Lothbury, E.C.</i>
1875		Patterson, Myles, Esq. 28, <i>Gloucester-place, Hyde-park, W.</i>
1876		Patterson, Maj.-Gen. Wm. Thos. Laird. 6, <i>Spring-gardens, S.W.</i>
1863		Pattinson, J., Esq. 21, <i>Bread-street, E.C.</i>
1868		Paul, J. H., Esq., M.D. <i>The Terrace, Camberwell, S.E.</i>
1876		Pauli, Capt. W. B., R.N. (H.M. Consul, <i>Porto Rico</i> ). <i>Care of Messrs. Woodhead and Co., 44, Charing-cross, S.W.</i>
1874		Paulson, W. H., Esq., B.A. <i>St. Lawrence-vicarage, Ramsgate.</i>
1872		Paxton, Robert Chas., Esq. 24, <i>Stafford-terrace, Phillimore-gardens, W.</i>
1877		Payne, Lieut.-Col. Geo. Massey. <i>East India United Service Club, 14, St. James's-square, S.W.</i>
1847		Paynter,* William, Esq., F.R.A.S. 21, <i>Belgrave-square, S.W.; and Camborne-house, Richmond, Surrey.</i>
1853		Peacock, George, Esq. <i>Starcross, near Exeter.</i>
1879		Peal, Samuel E., Esq. <i>Care of S. E. Peal, Esq., Fernhurst, Mattock-lane, Ealing, W.</i>
1876		Pearcy, Joseph, Esq. 127, <i>Englefield-road, Islington, N.</i>
1877		Pearson, Arthur A., Esq. <i>Colonial-office, S.W.</i>
1874		Pechey, J. T. Primrose, Esq. <i>Leytonstone, Essex.</i>
1853		Peckover,* Alexander, Esq., F.L.S. <i>Wisbech.</i>
1879		Pedder, W. G., Esq. 25, <i>St. Stephen's-square, W.; and India-office, S.W.</i>
1875		Peek,* Cuthbert E., Esq. <i>Wimbledon-house, S.W.</i>
1860		Peek,* Sir Henry William, Bart., M.P. <i>Wimbledon-house, S.W.</i>
1872		Peel,* Captain Francis. <i>Boxted-house, Colchester.</i>
1858		Peel, Right Hon. Sir Robert, Bart., G.C.B. 4, <i>Whitehall-gardens, S.W.; and Drayton-manor, Tamworth.</i>
1874		Pelham,* Hon. Arthur L. <i>Stanmer, Lewes, Sussex.</i>
1875	C. p.	Pelly,* Colonel Sir Lewis, K.C.B., K.C.S.L. <i>Athenæum Club, Pall-mall, S.W.</i>
1875		Pelly, Capt. Richard W., R.N. <i>Trinity House, Tower-hill, E.C.; and Holme-croft, Walthamstow, E.</i>

Year of Election		
1871		Pembroke, Right Hon. George R. C. Herbert, Earl of. <i>Wilton-house, Salisbury ; and 10, Victoria-square, Pimlico, S.W.</i>
1875		Pender, Staff-Comm. D., R.N. <i>Admiralty, Whitehall ; and Esquimalt, Thornton-hill, Wimbledon, S.W.</i>
1874		Pender, H. D., Esq. 18, <i>Arlington-street, S.W.</i>
1868		Pender,* John, Esq. 18, <i>Arlington-street, S.W.</i>
1879		Pengelly, Thomas, Esq. <i>Bodriggy-villa, Hayle, Cornwall.</i>
1863		Pennant,* Colonel S. S. Douglas. <i>Penrhyn-castle, Bangor.</i>
1859		Penrhyn,* Lord. <i>Penrhyn-castle, Bangor.</i>
1874		Pepys, Hon. Walter Courtenay. <i>Windham Club, St. James's-square, S.W.</i>
1860		Pereira, Francisco E., Esq.
1865		Perkins, William, Esq. <i>Rosario, Argentine Republic.</i>
1878		Periy, Right Rev. Charles. 32, <i>Avenue-road, N.W.</i>
1859		Perry, Sir Erskine (Member of the Council of India). 36, <i>Eaton-place, S.W.</i>
1865	P.	Perry, Gerald R., Esq. <i>British Consulate, Cadiz.</i>
1876		Petch, Richd., Esq. 16, <i>Westbourne-park, Hyde-park, W.</i>
1857		Peters,* William, Esq.
1879		Petherick,* Edward Augustus, Esq. 56, <i>Geneva-road, Brixton, S.W. ; and 17, Warwick-square, E.C.</i>
1860	P.	Petherick,* John, Esq. 66, <i>Tavistock-crescent, Westbourne-park, W.</i>
1879		Petley, Naval Lieut. Eaton W., R.N. <i>Calcutta.</i>
1871		Petter, G. Wm., Esq. <i>Streatham-grove, S.W.</i>
1866		Pharazyn, Robert, Esq. <i>Wellington, New Zealand. Care of Messrs. Scale and Rogers, 9, Fenchurch-street, E.C.</i>
1867	C.	Phayre, Lieut.-Gen. Sir Arthur, C.B., K.C.S.I. <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W. ; and East India United Service Club, S.W.</i>
1862		Phené,* John Samuel, Esq., LL.D., F.S.A., F.G.S. 5, <i>Carlton-terrace, Oakley-street, S.W.</i>
1879		Phibbs, Owen, Esq. <i>Care of W. Phibbs, Esq., Seafeld, Co. Sligo, Ireland.</i>
1873		Philbrick,* Frederick Adolphus, Esq. <i>Lamb-buildings, Temple, E.C.</i>
1860		Philip, George, Esq. 32, <i>Fleet-street, E.C.</i>
1872		Philipps, Herbert Rees, Esq. <i>India-office, S.W.</i>
1872		Philipps, Sutherland Rees, Esq., M.D. <i>Wonford-house, Exeter.</i>
1857		Phillimore, Rear-Admiral Augustus. <i>Shedfield, Fareham, Hants ; and India United Service Club, S.W.</i>
1859		Phillimore, Charles Bagot, Esq. <i>Hurley Manor-house, Great Marlow ; and India-office, S.W.</i>
1878		Phillimore, Rear-Admiral Henry B., C.B.
1860		Phillimore, Captain William Brough (Grenadier Guards). 7, <i>Hyde-park-gardens, W.</i>
1869		Phillips, Edw. Aug., Esq.
1873	p.	Phillips, Geo. Esq. (H.M. Consul, Kiukiang). <i>Care of Jno. Marsh, Esq., 29, High-street, Maidstone.</i>



Year of Election.	
1880	Phillips, Noblet, Esq. 31, <i>Cambridge-gardens, Notting-hill, W.</i>
1877	Phillips, Thomas Ernest, Esq. <i>St. Mary's School, Seymour-street, Euston-square, N.W.</i>
1875	Phillips-Wolley, C. L., Esq. <i>Morgan-hall, Fairford, Gloucestershire.</i>
1873	Philp, Capt. Fras. Lamb (Royal Scots Greys). <i>Pendoggett, Timsbury, near Bath; and Army and Navy Club, S.W.</i>
1871	Philpott, Edward P., Esq., M.D., LL.D. <i>Poole, Dorsetshire.</i>
1878	Phipson-Wybrants, Capt. Temple Leighton, J.P. <i>Dunlow, Moy, Co. Tyrone, Ireland.</i>
1872	Pickering,* John, Esq. <i>The Abnalls, Mount Preston, Leeds.</i>
1871	Pickersgill, Wm. Cunliffe, Esq. 58, <i>Prince's-gate, S.W.</i>
1878	Pierce, Edwin, Esq. <i>Gwadur, Persian Gulf. Care of Messrs. King and Co., 65, Cornhill, E.C.</i>
1875	Pierce, John Timbrell, Esq. 3, <i>Middle Temple-lane, Temple; Frettons, Danbury, Chelmsford; and Reform Club, S.W.</i>
1871	Pierce, Josiah, Esq. 12, <i>Beaufort-gardens, Brompton-road, S.W.</i>
1870	Pigott, Robt. Turtle, Esq., D.C.L. <i>Manor-park, Lee, Kent; and 36, Southampton-street, Strand, W.C.</i>
1874	Pigott, Thomas Digby, Esq. 5, <i>Ovington-gardens, S.W.</i>
1864	Pigou,* F. A. P., Esq. <i>Dartford, Kent.</i>
1852	Pike,* Captain John W., R.N. 116, <i>Holland-road, Kensington, W.</i>
1855	Pilkington, James, Esq. <i>Blackburn.</i>
1852	P. Pim,* Captain Bedford C. T., R.N. <i>Leaside, Kingswood-road, Upper Norwood, S.E.; 2, Crown-office-row, Temple, E.C.; and Senior and Junior United Service Clubs, S.W.</i>
1870	Pimblett, Rev. James. 26, <i>Great Avenham-street, Preston.</i>
1880	Pine, Sir Benjamin, K.C.M.G. <i>Oriental Club, Hanover-square, W.</i>
1859	Pinney, Colonel William. 30, <i>Berkeley-square, W.</i>
1879	Pirkis, Albert E., Esq. <i>Penlee, Richmond, Surrey.</i>
1879	Pirkis, Fredk. E., R.N. <i>Penlee, Richmond, Surrey.</i>
1877	Pitman, C. E., Esq. <i>Hillside, Guildford.</i>
1872	Plaister, W. H., Esq., M.R.C.S., &c. <i>Tottenham, Middlesex.</i>
1871	Platt, Colonel Chas. Rowley. 4, <i>Bolton-street, Piccadilly, W.</i>
1865	Player, John, Esq. 22, <i>Carpenter-road, Edgbaston, Birmingham.</i>
1860	P. Playfair, Lieut.-Col. Robert Lambert (H.B.M. Consul-General, Algiers). <i>Care of Messrs. H. S. King and Co., 45, Pall-mall, S.W.</i>
1880	Plowden, Trevor, Esq. (H. B. M.'s Consul-General, Bagdad, Turkish Arabia).
1856	Plowes,* John Henry, Esq. 39, <i>York-terrace, Regent's-park, N.W.</i>
1880	Plunket, Hon. Francis. <i>Travellers Club, Pall-mall, S.W.; and care of Foreign-office, S.W.</i>
1875	Plunkett,* Capt. Geo. T., R.E. <i>Chatham. Care of Messrs. Cox and Co., Craig's-court, S.W.</i>
1878	Poland,* Jno., Esq. <i>Eliot-vale-house, Blackheath.</i>
1873	Pollard, Henry Thos., Esq. 4, <i>Threudneedle-street, E.C.</i>

Year of  
Election

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| 1855 | Pollexfen,* Captain J. J. <i>India.</i>  |
| 1866 | Pollington,* John Horace, Viscount. 8, <i>John-street, Berkeley-square, W.</i>   |
| 1835 | Ponsonby,* The Hon. Frederick G. B. 3, <i>Mount-street, Grosvenor-square, W.</i>   |
| 1877 | Poole, Major Wm. John E. (60th Royal Rifles). <i>Southampton.</i>  |
| 1857 | Pope, Captain Wm. Agnew. <i>Union Club, Trafalgar-square, S. W.</i>  |
| 1874 | Porges,* Theodore, Esq. 11, <i>Rue Montalivet, Paris.</i>  |
| 1871 | Portal,* Wm. Richd., Esq., M.A. <i>Tonge-house, Lower Norwood, S.E.</i>  |
| 1877 | Porter, Henry, Esq. 181, <i>Strand, W.C.</i>   |
| 1874 | Potter, Richard, Esq. <i>Standish-house, Stonehouse, Gloucestershire.</i>  |
| 1878 | Potter, Rev. Wm. <i>Emerald-hill, near Melbourne.</i>  |
| 1867 | Potter, Wm. H., Esq. <i>Care of G. T. White, Esq., Kivara, Tooting-common.</i>   |
| 1861 | Pounden,* Captain Lonsdale. <i>Junior United Service Club, S. W.; and Browns-wood, Co. Wexford.</i>  |
| 1862 | Povah, Rev. John V., M.A. 11, <i>Dawson-place, Pembroke-square, W.</i>   |
| 1878 | Powell, Frederick, Esq. <i>The School-house, Bakewell, Derbyshire.</i>   |
| 1864 | Powell,* F. S., Esq. 1, <i>Cambridge-square, Hyde-park, W.</i>   |
| 1859 | Power, E. Rawdon, Esq. <i>Heywood-lodge, Tenby, South Wales; and Thatched-House Club, S. W.</i>  |
| 1868 | Pownall, John Fish, Esq. 63, <i>Russell-square, W. C.</i>  |
| 1864 | Powys, The Hon. Leopold. 16, <i>Queensberry-place, S. W.</i>   |
| 1870 | Prance,* Reginald H., Esq. <i>Frognaal, Hampstead.</i>   |
| 1879 | Prater, Lieut. Charles Golding, R.N. <i>Kincora, Torquay.</i>  |
| 1873 | Preedy, Col. H. William. <i>The Chantry, Fladbury, near Pershore, Worcestershire.</i>  |
| 1873 | p. Prevost,* Admiral J. C. 44, <i>South Eaton-place, S. W.</i>   |
| 1868 | Price, Charles S., Esq. <i>Bryn Derwen, Neath.</i>   |
| 1869 | Price, F. G. H., Esq. 1, <i>Fleet-street, E.C.</i>   |
| 1869 | Price, James, Esq. 53, <i>Redcliffe-gardens, South Kensington, S. W.</i>   |
| 1852 | Price, James Glenie, Esq. 14, <i>Clement's-inn, W. C.</i>  |
| 1873 | Price,* J. M., Esq., C.E.  |
| 1876 | Price, Sir Rose Lambert, Bart. <i>Naval and Military Club, Piccadilly, W.</i>  |
| 1878 | Price, Thomas Phillips, Esq. <i>Triley-court, Abergavenny, Monmouthshire.</i>  |
| 1860 | Prickett,* Rev. Thomas William, M.A., F.S.A. 11, <i>Lypiatt-terrace, Cheltenham; and United University Club, Pall-mall East, S. W.</i>                 |
| 1868 | p. Prideaux, Colonel W. F., Bombay Staff Corps. 2, <i>Sidlaw-terrace, Bognor, Sussex.</i>  |
| 1879 | Pridham, Wm. J., Esq. <i>St. James's-school, Teignmouth, Devon.</i>  |
| 1877 | Prince, John, Esq. <i>Devonshire Club, St. James's-street, S. W.</i>   |
| 1873 | Prince, John Sampson, Esq. 34, <i>Craven-hill-gardens, Hyde-park, W.</i>   |
| 1865 | Pringle,* A., Esq. <i>Yair, Selkirk, N. B.</i>   |
| 1879 | Pringle, Edw. Hamilton, Esq. <i>Care of Messrs. Wheatley and Co., 156, Leadenhall-street, E.C.; and Scientific Club, 7, Savile-row, W.</i>             |
| 1878 | Pringle, Major Sir Norman Wm. Drummond, Bart. (38th Regiment). <i>Malta.</i>   |
| 1855 | Pringle,* Thomas Young, Esq. <i>Reform Club, S. W.</i>   |
| 1866 | Prinsep,* Edw. Aug., Esq., B.C.S. (Commissioner of Settlements in the Punjab, Umritsur). <i>Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i> |

Year of Election.	
1868	Pritchard, Lieut.-Col. Gordon Douglas, R.E. <i>Montague-road, Richmond; and United Service Club, Pall-mall, S.W.</i>
1874	Probyn, Maj.-General Sir Dighton Macnaughten, V.C., K.C.S.I., C.B. <i>The Garden-mansions, Queen Anne's-gate, S.W.</i>
1874	Procter, Jno., Esq. <i>Cromwell-house, Long Preston, Leeds; and 2, Crown-office-row, Temple, E.C.</i>
1872	Proctor, Samuel, Esq. (Head Master, Borough Schools, San Fernando, <i>Trinidad</i> ). <i>Care of E. H. Penney, Esq., 17, Lime-street, E.C.</i>
1866	Proctor-Sims,* Richard, Esq., C.E. (Exec. Engineer, Bhowanuggur, <i>Kattywar</i> ). <i>Care of J. R. Manning, Esq., 7, Westminster-chambers, S.W.</i>
1861	Prodders,* Edwin, Esq. <i>The Rectory, Ayott St. Peter's, Herts.</i>
1874	Protheroe, Capt. Montague. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.; and Junior United Service Club, S.W.</i>
1874	Protheroe, Pryse, Esq. <i>Gothic-cottage, Adelaide-road, Surbiton.</i>
1877	Prouse, Oswald Milton, Esq. <i>Westbourne-house, Shaftesbury-road, Hammer-smith, W.</i>
1852	Prout, John William, Esq., M.A. <i>Athenæum Club, S.W.; and Neasdon, Middlesex, N.W.</i>
1878	Pryce, Capt. Chas. E. (Supt. Board of Trade). <i>"The Park," Hull.</i>
1875	Pryor, Rev. Jno. Eade. <i>Bennington-rectory, Stevenage, Herts.</i>
1878	Puckle, Major-General James. 2, <i>The Terrace, Church-road, Upper Norwood.</i>
1862	Puget,* Lieut.-Colonel J. 8, <i>Cambridge-gate, Regent's-park, N.W.</i>
1872	Puleston, John H., Esq. 2, <i>Bank-buildings, Princes-street, E.C.</i>
1860	Puller, Arthur Giles, Esq. <i>Athenæum Club, S.W.; Arthur's Club, S.W.; and Youngsbury, Ware.</i>
1876	Pullman, Henry, Esq. <i>"Normandy," Kew-road, Richmond.</i>
1876	Pullman, Jno., Esq. <i>Grove-end, Chiswick.</i>
1872	Punsfer, Wm. B., Esq.
1869	Purdon, Lieut. George Frederic, R.N. <i>Tinenara, Killaloe, Co. Clare.</i>
1865	Pusey,* Sidney E. Bouverie, Esq.
1870	Pycroft, Sir Thomas, K.C.S.I. 17, <i>Cleveland-gardens, Hyde-park, W.</i>
1861	Quin, Lord George. 15, <i>Belgrave-square, S.W.</i>
1870	Quin, Geo., Esq. <i>Worcester, Cape-town. Care of Messrs. White and Holmes 20, Mudmay-chambers, Bishopsgate-street-within, E.C.</i>
1862	Quin, John Thomas, Esq. <i>Care of Mr. Jno. B. Williams, 101, Highbury-hill, N.</i>
1871	Radcliffe, Sir Joseph P., Bart. <i>Rudding-park, Knarcsborough.</i>
1858	Radstock,* Granville Augustus, Lord. <i>East Sheen, S.W.</i>
1869	Rae, Edward, Esq. <i>Red-court, Birkenhead.</i>

Year of Election.		
1876		Rae, Henry, Esq. 15, <i>Old-square, Lincoln's-inn, W.C.; and Oxford and Cambridge Club, Pall-mall, S.W.</i>
1862		Rae,* James, Esq. 32, <i>Phillimore-gardens, Kensington, W.</i>
1853	G. C. p.	Rae, John, Esq., M.D., LL.D., F.R.S. 4, <i>Addison-gardens South, Holland-villas-road, Kensington, W.</i>
1870		Raikes, Francis Wm., Esq. <i>Junior Carlton Club.</i>
1871		Ralli, Eustatius, Esq. 93, <i>Lancaster-gate, W.</i>
1871		Ralli, Pandeli, Esq. 17, <i>Belgrave-square, S.W.</i>
1873		Rambaut, John, Esq., M.D. <i>The Grange, Godstone, Surrey.</i>
1866		Ramsay, Alex., Esq. <i>Kilmorye-lodge, Castlebar, Ealing, W.</i>
1867		Ramsay, John, Esq. <i>Islay, N.B.</i>
1875		Ramsay, Major John. <i>Straloch, Aberdeenshire.</i>
1880		Ramsden, Sir James, Knt. <i>Barrow-in-Furness.</i>
1867		Ramsden,* Richard, Esq., B.A.
1869		Randell,* Rev. Thomas, B.A. 28, <i>Friar's Entry, Oxford.</i>
1878		Randolph, Vice-Admiral George G., C.B. 70, <i>Brunswick-place, Brighton; and United Service Club, Pall-mall, S.W.</i>
1874		Rankin, Capt. Fras. W. <i>Worcester-park, Surrey.</i>
1880		Rankin, Lionel Kentish, Esq. <i>Northwick-villa, Clifton.</i>
1868		Rankin, William, Esq. <i>Tiernaleague, Carndonagh, Donegal.</i>
1866		Ransom,* Edwin, Esq. <i>Kempstone, near Bedford.</i>
1876		Rapier, Richard C., Esq., C.E. 5, <i>Westminster-chambers, S.W.</i>
1869	P.	Rassam, Hormuzd, Esq. <i>Nineveh-house, Spring-grove, Isleworth.</i>
1859		Ratcliff, Colonel Charles, F.S.A. <i>Athenæum Club, S.W.; Edgbaston, Birmingham; and Downing College, Cambridge.</i>
1861		Rate, Lachlan Macintosh, Esq. 9, <i>South Audley-street, W.</i>
1873		Ravenscroft, W. H., Esq. <i>Care of Sir C. McGrigor and Co., 25, Charles-street, St. James's-square, S.W.</i>
1859		Ravenstein, Ernest G., Esq. <i>Alpha-cottage, Lorn-road, Brixton, S.W.</i>
1875		Rawlings, H. D., Esq., F.G.S. <i>Netherlands. Chalk-hill, Kingsbury, N.W.</i>
1875		Rawlins, William Donaldson, Esq., M.A. 4, <i>Wimpole-street, Cavendish-square, W.</i>
1861		Rawlinson, Sir Christopher. 89, <i>Eaton-square, S.W.; and The Lawn, Swindon.</i>
1844	PRES.	Rawlinson,* Major-General Sir Henry C., K.C.B., D.C.L., LL.D., F.R.S. <i>Athenæum Club, S.W.; and 21, Charles-street, Berkeley-square, W.</i>
1874	Gf. p.	Rawson, Christopher, Esq. <i>Kingsthorpe, Castle-road, Southsea, Hants.</i>
1876		Rawson, Philip, Esq. <i>Woodhurst, Crawley, Sussex.</i>
1838	C.	Rawson, Sir Rawson Wm., K.C.M.G., C.B. <i>Drayton-house, West Drayton, Middlesex.</i>
1875		Rawson, Lieut. Wyatt, R.N. <i>Kingsthorpe, Castle-road, Southsea, Hants.</i>
1869		Ray, Major Alfred William. <i>The Lodge, Brixton-oval, S.W.</i>
1872		Ray, Surgeon-General George H., M.D. <i>Hamam-chambers, 76, Jermyn-street, S.W.</i>

Year of Election.	
1874	Rayleigh,* Lord. <i>Terling-place, Witham, Essex.</i>
1873	Read, Frederick, Esq. 45, <i>Leinster-square, W.</i>
1874	Read, F. W. C., Esq. 17, <i>Coleherne-road, S. Kensington, S.W.</i>
1877	Read, Gen. John Meredith (Minister of the U.S. in Greece). <i>Athens. Care of B. F. Stevens, Esq., 4, Trafalgar-square, S.W.</i>
1879	Reay, Lord. 6, <i>Great Stanhope-street, W.</i>
1865	Redhead, R. Milne, Esq., F.L.S. <i>Springfield, Seedley, Manchester; Conservative Club, S.W.; and Junior Carlton Club, S.W.</i>
1868	Redman,* John B., Esq., C.E. 7, <i>Little Queen-street, Westminster, S.W.</i>
1871	Reed, Andrew Holmes, Esq. <i>Strathern, Amhurst-park, Stamford-hill.</i>
1877	Reed, John William, Esq. 27, <i>Clarence-street, Islington, N.</i>
1866	Rehden,* George, Esq. 15, <i>Richmond-terrace, Clapham-road, S.W.</i>
1877	Reid, Alexander, Esq. <i>Georgetown, British Guiana. Care of the Colonial Bank, 8, Bishopsgate-street, E.C.</i>
1861	Reid,* David, Esq.
1861	Reilly, Anthony Adams, Esq. 1, <i>Paper-buildings, Temple, E.C.; and Goodebrooke, Delgany, Ireland.</i>
1869	Reiss,* James, Esq. 7, <i>Cromwell-road-houses, South Kensington, S.W.</i>
1877	Remfry, Frederick Ernest, Esq. <i>Firsleigh, Torquay.</i>
1872	Remfry, Jno., Esq. <i>The Grange, Nightingale-lane, Clapham-common, S.W.</i>
1866	Rennie,* John Keith, Esq., M.A. Camb. 2, <i>Eccleston-square, S.W.</i>
1877	Rennie, John Thomson, Esq. 6, <i>East India-avenue, E.C.; and Deemount-house, Aberdeen.</i>
1834	Rennie,* M. B., Esq., C.E. <i>Care of James Rennie, Esq., 9, Motcomb-street, Belgrave-square, S.W.</i>
1864	Rennie, W., Esq. 6, <i>Great Cumberland-place, W.</i>
1877	Renshaw, Chas. B., Esq. <i>Elderslie, Renfrewshire, N. B.</i>
1830	Renwick,* General W. F., R.E. 21, <i>Bassett-road, Notting-hill, W.</i>
1861	Reuter, Julius, Baron de. <i>Kensington-palace-gardens, W.</i>
1858	Reynardson, Henry Birch, Esq. <i>Adwell, near Tetworth, Oxfordshire.</i>
1872	Reynolds, William Henry, Esq. <i>Care of Messrs. King and Co., 65, Cornhill, E.C.</i>
1867	Rhodes, Arthur John, Esq. <i>Sunnyside, St. Albans.</i>
1874	Rhodes, Hon. Wm. Barnard (Mem. Legis. Council, New Zealand). <i>Wellington, New Zealand. Care of Messrs. Jas. Morrison and Co., 4, Fenchurch-st., E.C.</i>
1863	Ricarde-Seaver,* Major F. Ignacio. <i>Conservative Club, St. James's, S.W.</i>
1870	Rice, Wm., Esq.
1868	Richards, Alfred, Esq. <i>Tewkesbury-lodge, Forest-hill.</i>
1874	Richards, Capt. F. W., R.N., C.B. <i>United Service Club; and H.M.S. 'Devastation,' Channel Squadron.</i>
1857	C. p. Richards, Admiral Sir George H., C.B., F.R.S. <i>Vancouver-house, Forest-hill, S.E.</i>
1874	Richards, M. W., Esq. <i>Shore-road, S. Hackney, E.</i>
1877	Richardson, Edwin J., Esq. 28, <i>Duke-street, Manchester-square, W.</i>
1864	Richardson, F., Esq. <i>Juniper-hall, Mickleham, Dorking.</i>
1880	Riches,* Arthur, Esq. <i>Brunswick College School, Leamington.</i>

Year of Election.	
1875	Rider, T. F., Esq. <i>The Grove, Clapham-road, S. W.</i>
1873	Riddell, Lieut. H. S. Hutton (2nd Battalion 60th Rifles). <i>Meerut.</i>
1876	Rideal, John, Esq. <i>Devon-lodge, Mayow-road, Forest-hill.</i>
1877	Ridgway, John Ambrose, Esq. <i>Foundation School, Beverley.</i>
1864	Ridley, F. H., Esq.
1864	Ridley, George, Esq. 2, <i>Charles-street, Berkeley-square, W.</i>
1874	Ridpath, James Lionel, Esq. <i>Devon-lawn, Wimbledon-park.</i>
1875	Ridpath, Thomas Alex., Esq. 9, <i>Belsize-park, Hampstead.</i>
1862	C. p. Rigby,* Major-General Christopher Palmer. <i>Oriental Club, W.; and 14, Mansfield-street, W.</i>
1868	Riley, Captain Charles Henry. <i>Junior United Service Club, S. W.</i>
1879	Rimmel, Eugene, Esq. <i>Strand, W. C.</i>
1860	Rintoul, Robert, Esq. <i>Windham Club, S. W.</i>
1853	PRES. Ripon, Most Hon. Geo. Fredk. Sam., Marquis of, K.G., F.R.S. 1, <i>Carlton-gardens, S. W.; and Studley Royal, Ripon.</i>
1874	Ritchie, Rev. George St. Martin (Chaplain to the Forces).
1859	Rivers, Major-Gen. Pitt. 19, <i>Pen-y-wern-road, South Kensington, S. W.</i>
1877	Robarts, H. C., Esq. 41, <i>Lowndes-square, S. W.</i>
1876	Roberts, Rev. Chas. M. <i>The Grammar-school, Monmouth.</i>
1868	Roberts,* Charles W., Esq. <i>Penrith-house, Effra-road, Brixton, S. W.</i>
1875	Roberts, W. C., Esq. <i>New Zealand.</i>
1874	Robertson, A. D., Esq. 53, <i>Queen's-gate, S. W.</i>
1860	Robertson, Sir D. Brooke, C.B. <i>Athenæum Club, S. W.</i>
1875	Robertson, D. I. U., Esq. 174, <i>Chatham-street, Fulkner-square, Liverpool.</i>
1861	Robertson,* Graham Moore, Esq. 21, <i>Cleveland-square, Hyde-park, W.</i>
1877	Robertson,* Henry, Esq., M.P. 13, <i>Lancaster-gate, W.; and Pali-hall, Corwen, N. Wales.</i>
1870	Robertson,* James Nisbet, Esq. <i>Fewlands, Banstead, Surrey.</i>
1863	Robertson, R. B., Esq. (H.M. Consul, <i>Yokohama, Japan.</i> )
1873	Robertson, Major Wheatley. 35, <i>Queen's-gardens, W.</i>
1880	Robin,* Charles Janvrin, Esq. <i>United University Club, Pall-mall East, S. W.</i>
1870	Robinson, Alfred, Esq. <i>Elm-bank, Huddersfield.</i>
1875	Robinson,* Arthur M., Esq. 32, <i>Devonshire-road, Cloughton, Birkenhead.</i>
1873	Robinson, Capt. F. C. B., R.N. <i>Care of London Joint Stock Bank, Pall-mall, S. W.</i>
1872	Robinson, Henry, Esq., M.L.C.E., F.G.S. 7, <i>Westminster-chambers, S. W.</i>
1859	Robinson, Sir Hercules G. R., G.C.M.G. <i>Messrs. Burnett, 17, Surrey-street, W. C.</i>
1878	Robinson, James, Esq. <i>Dulwich-college, Dulwich.</i>
1864	Robinson, John, Esq. <i>Care of Messrs. Street and Co., 30, Cornhill, E. C.</i>
1874	Robinson, John, Esq., C.E. <i>Kingscote, East Grinstead.</i>
1865	Robinson, J. R., Esq., LL.D., F.S.A. Scot., F.G.S. Edin. 597, <i>Westgate, Dewsbury.</i>
1862	Robinson, Colonel Sir John Stephen, Bart. <i>Arthur's Club, S. W.</i>
1860	Robinson, Mr. Serjeant (B.C.). 43, <i>Mecklenburgh-square, W. C.</i>

Year of Election		
1878		Robinson, Vincent Joseph, Esq. 34, <i>Weymouth-street, W.</i>
1850		Robinson,* Captain Walter F., R.N. <i>Care of Dr. Addison, 10, Albert-road Brighton.</i>
1872		Robinson, Wm., Esq., C.M.G. <i>Colonial-office, S.W.</i>
1870		Robinson, Sir W. C. F., K.C.M.G., Governor of W. Australia. <i>Care of Colonial-office, S.W.</i>
1880		Rocher,* Emile, Esq. 8, <i>Storey's-gate, St. James's-park, S.W.</i>
1858		Rochester, Right Rev. A. W. Thorold, Bishop of. <i>Selsdon-park, Croydon; and Athenæum Club, S.W.</i>
1830		Rodd,* James Rennell, Esq. 29, <i>Beaufort-gardens, S.W.</i>
1879		Rodd, W. Henry, Esq. <i>Leskinwick, Penzance.</i>
1874		Rogers, Major Ebenezer. <i>Gatling-house, Great Cheetham-street, Manchester.</i>
1877		Rogers, Edward C., Esq. <i>Three Counties Asylum, Stotfold, Baldock.</i>
1863		Rogers, John T., Esq. <i>River-hill, Sevenoaks.</i>
1874		Rogerson, Geo. Russell, Esq., F.R.A.S. <i>Beech-cottage, Calderstone-road, Allerton, near Liverpool.</i>
1861		Rollo, Lord. <i>Dumcrieff-castle, Moffat, N.B.</i>
1866	P.	Rooke, Major W., R.A. <i>Formosa, Lymington, Hants.</i>
1871		Rooks, Geo. Arthur, Esq. 12, <i>Bloomsbury-square, W.C.</i>
1868		Rose, Henry, Esq. 8, <i>Porchester-square, Hyde-park, W.</i>
1872		Rose, H. Cooper, Esq., M.D. <i>Hampstead, N.W.</i>
1861		Rose, Jas. Anderson, Esq. <i>Wandsworth, Surrey, S.W.; and 11, Salisbury-street, W.C.</i>
1870		Rose, The Right Hon. Sir John, Bart., K.C.M.G. 18, <i>Queen's-gate, Hyde-park, S.W.</i>
1857		Rose,* Colonel Sir Wm. Anderson, Alderman, F.R.S.L. <i>Carlton Club, S.W.; 66, Upper Thames-street, E.C.; and Upper Tooting, S.W.</i>
1878		Rosenthal, Alfred Ephraim, Esq. <i>Care of J. D. Rosenthal, Esq., 10, Suffolk-street, Dublin.</i>
1876		Rosenthal, L., Esq. 10, <i>Delamere-terrace, N.W.</i>
1876	P.	Ross, Lieut.-Col. E. C. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1870		Ross, Capt. Geo. Ernest Augustus. <i>Forfar-house, Cromwell-road, South Kensington, S.W.</i>
1879		Ross of Bladensburg,* Lieut. John, C.G. 27, <i>Westbourne-place, Eaton-square, S.W.</i>
1878		Ross, Rev. Geo. Gould. <i>St. Andrew's College, Grahamstown.</i>
1864		Roundell,* C. S., Esq., M.P. 16, <i>Curzon-street, Mayfair, W.</i>
1864		Routh*, E. J., Esq., M.A., F.R.S., F.R.A.S., &c. <i>St. Peter's College, Cambridge.</i>
1874		Routledge, Edmund, Esq. 40, <i>Clanricarde-gardens, Bayswater, W.</i>
1876		Routledge, Thomas, Esq. <i>Clazheugh, Sunderland.</i>
1872		Row,* A. V. Nursing, Esq. <i>Daba-garden, Vizagapatam, India. Care of Messrs. King and Co., 65, Cornhill, E.C.</i>
1868		Rowlands,* Percy J., Esq. <i>India-office, S.W.</i>
1863		Rowley, Captain C., R.N. 33, <i>Cadogan-place, S.W.</i>

Year of  
Election.

- 1879 Royds,\* Clement M., Esq., J.P. *Greenhill, Rochdale, Lancashire.*
- 1856 Rucker, J. Anthony, Esq. *Blackheath, S.E.*
- 1876 Rudge, Wm. Newland, Esq. 17, *South Audley-street, W.; and Ethyl-lawn, Torquay, Devon.*
- 1861 Rumbold,\* Charles James Augustus, Esq. 5, *Percival-terrace, Brighton.*
- 1874 Rumbold, Capt. H. E. W. *Junior United Service Club, Charles-street, S.W.*
- 1861 Rumbold, Thomas Henry, Esq. 38, *Sussex-square, Brighton.*
- 1860 Rumley, Major-General Randal. 16, *Eaton-terrace, Eaton-square, S.W.*
- 1874 Rusden,\* Geo. W., Esq. *Care of R. B. Otley, Esq., 39, Ludbroke-square, W.*
- 1858 C. Russell,\* Lord Arthur, M.P. 2, *Audley-square, W.*
- 1869 Russell, George, Esq., M.A. *Viewfield, Southfields, Wandsworth; and 16, Old Change, St. Paul's, E.C.*
- 1875 Russell, Peter N., Esq. *Junior Carlton Club, Pall-mall, S.W.*
- 1875 Russell,\* Robert, Esq. 42, *Albemarle-street, W.*
- 1875 Russell, Thomas, Esq. *Haremere-hall, Hurstgreen, Sussex.*
- 1876 Russell, Thomas, Esq. 22, *Kensington-palace-gardens, W.*
- 1860 Russell, Wm. Howard, Esq., LL.D. *Carlton Club, S.W.*
- 1876 Rutherford,\* David Greig, Esq. *Care of Rev. P. Rutherford, 34, Grey-street, Park-grove-place, Glasgow.*
- 1860 Rutherford, John, Esq. 2, *Cavendish-place, Cavendish-square, W.*
- 1876 Rutson, Albert O., Esq. 7, *Half-Moon-street, W.*
- 1877 Rutson, John, Esq. *Newby Wiske, Thirsk, Yorkshire.*
- 1873 P. Ruxton, Captain W. Fitzherbert, R.N. 41, *Cornwall-gardens, S.W.*
- 1857 C. Ryder,\* Admiral Alfred P. *Admiralty-house, Portsmouth.*
- 1864 Ryder, G., Esq.
- 1873 Sabel, Ernest E., Esq. 185, *Maida-vale, W.*
- 1852 C. p. Sabine, Lieut.-General Sir Edw., R.A., K.C.B., F.R.A.S., &c. 13, *Ashley-place, Victoria-street, Westminster, S.W.*
- 1875 Sadgrove, Arthur William, Esq. 64, *Mark-lane, E.C.; and Eltham, Kent.*
- 1874 St. Albans, His Grace The Duke of. *Bestwood-park, Arnold, Notts.*
- 1873 St. Clair, John, Esq. *Newton Stewart, Wigtonshire.*
- 1874 St. Jean, Le Vicomte Ernest de Satgé. *Malvern Wells; and Junior Athenæum Club.*
- 1867 St. John, Major Oliver Beauchamp Coventry, R.E., C.S.I. (H.M. Consul, *Asterabad*). *Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
- 1862 p. St. John, Spenser, Esq., British Minister for Peru. 150, *Cambridge-street, Pinlicko, S.W.*
- 1863 Sale, Captain M. T., R.E. 6, *Albemarle-street, W.*
- 1867 Salkeld, Colouel J. C. (H.M. Indian Forces). 29, *St. James's-street, S.W.*
- 1868 Salles, J. de, Esq. 59, *Stanhope-gardens, South Kensington, S.W.*
- 1869 Salmond,\* Robert, Esq.



Year of  
Election.  
1875

Salomons,\* Sir David, Bart. *Broom-hill, Tunbridge Wells; and 46, Upper Berkeley-street, W.*

1863

Salt,\* Henry, Esq. *Egremont, Bournemouth.*

1875

Salthouse, Rev. Robert. *St. James's-parsonage, West Derby.*

1861

Sandbach,\* Wm. Robertson, Esq. 10, *Prince's-gate, Hyde-park, S.W.*

1867

Sandeman, Captain David George.

1877

Sandeman,\* Fleetwood, Esq. 15, *Hyde-park-gardens, W.*

1874

Sanderson, Rev. Edward. *The Vicarage, High Hurst Wood, Uckfield Sussex.*

1879

Sanderson,\* T. H., Esq., C.B. 65, *Wimpole-street, W.*

1877

Sandilands, John Alexander, Esq.

1880

Sanford,\* Lieut.-Colonel George Edward L. S. *Quartermaster-General's-office, Fort William, Calcutta.*

1862

Sanford, Lieut.-Colonel Henry Ayshford. 29, *Chester-street, Grosvenor-place, S.W.; and Nynehead-court, Wellington, Somerset.*

1870

Sanford, W. Ayshford, Esq., F.R.S. *Nynehead-court, Wellington, Somerset.*

1878

Sapp, John James, Esq. *Palmerston-road, Southsea.*

1860

P. Sarel, Major-General H. A., C.B., *Rollsby-hall, Great Yarmouth; and United Service Club, Pall-mall, S.W.*

1869

Sarll, John, Esq. *Beauvoir-house, Hollington-park, St. Leonards-on-Sea.*

1860

Sartoris, Alfred, Esq. *Abbottswold, Stow-on-the-Wold.*

1852

Saumarez, Rear-Admiral Thomas, C.B. *The Firs, Jersey.*

1874

Saunders, Fras., Esq. 6, *Limes-grove, Lewisham, S.E.*

1874

Saunders, Howard, Esq. 7, *Radnor-place, Gloucester-square, W.*

1866

Saunders, James Ebenezer, Esq., F.L.S., F.G.S., F.R.A.S. 9, *Finsbury-circus; and Chelvestone, 36, Lee-terrace, Blackheath, S.E.*

1879

Saurin, Dudley E., Esq. 37, *Prince's-gate, S.W.*

1878

Savory, Major H. B. *Naval and Military Club, Piccadilly, W.*

1863

Sawyer, Major-General Charles (6th Dragoon Guards). 20, *Roland-gardens, S.W.*

1875

Schäfer,\* Wm. Fredk., Esq. *Lydstep-house Highgate, N.*

1874

Schalch, Vernon Rodolph, Esq. 29, *Dorset-square, N.W.*

1878

Schiff, Alfred G., Esq. *Santandrea, Cranford, near Hounslow, Middlesex.*

1874

Scholfield, William F., Esq. 55, *Onslow-gardens, S.W.*

1878

Schön, Rev. James Frederick. *Palm-house, Chatham, Kent.*

1880

Sclater, P. L., Esq., F.R.S. 11, *Hanover-square, W.*

1870

Scobell, Sandford Geo. T., Esq. *Down-house, Red Marley, Gloucester.*

1875

Sconce, Gideon C., Esq. 14, *St. James's-square, S.W.*

1872

Scott, Abraham, Esq.

1866

Scott, Adam, Esq. 10, *Knatchbull-road, Camberwell.*

1866

Scott, Arthur, Esq. *Rotherfield-park, Alton, Hants; and Travellers' Club, S.W.*

1879

Scott, Sir A. D., Bart. 97, *Eaton-square, S.W.*

1873

Scott,\* Dugald, Esq. *The Moorlands, Kersal-edge, Manchester.*

1878

Scott, Major-General Edw. W. 33, *Brunswick-gardens, Campden-hill, W.*

Year of  
Election.

- 1859 Scott, Lord Henry. 3, *Tilney-street, Park-lane, W.*
- 1861 Scott,\* Hercules, Esq. *Brotherton, near Montrose, N. B.*
- 1877 Scott,\* James Benjamin, Esq. 32, *Coal Exchange, City, E.C.; and Walthamstow.*
- 1875 Scott, John Charles A., Esq. 6, *Cambridge-gate, Regent's-park, N.W.*
- 1877 Scott, Capt. P. A., R.N. *Care of W. T. Littlejohns, Esq., Royal Naval College, Greenwich, S.E.*
- 1878 Scott, Wm., Esq. 6, *Chepstow-place, Bayswater.*
- 1877 Scrutton, Alexander, Esq. 2, *Upper St. John's-park, Blackheath, S.E.*
- 1863 Scovell, George, Esq. 25, *Grosvenor-place, S.W.*
- 1873 Searight, Hugh Ford, Esq. 7, *East India-avenue, E.C.*
- 1861 Searight, James, Esq. 80, *Lancaster-gate, W.*
- 1879 Seaton, George, Esq. *East London Water-works, Old Ford, E.*
- 1867 Seaton, Maj.-Gen. Lord. D3, *Albany, W.*
- 1869 Sedgwick, Jno. Bell, Esq. 1, *St. Andrew's-place, Regent's-park, N.W.*
- 1878 P. Seebohm, Henry, Esq. 6, *Tenterden-street, Hanover-square, W.*
- 1876 Seeley, Harry G., Esq., F.L.S., F.G.S., &c. 61, *Adelaide-road, N.W.*
- 1877 Seely,\* Charles, Esq., jun., M.P. 7, *Queen's-gate-gardens, South Kensington, S.W.; and Sherwood-lodge, Nottinghamshire.*
- 1876 Segrave, Capt. W. F. (H.M. Consul, *Stockholm*).
- 1858 Serocold,\* Charles P., Esq. *Brewery, Liquorpond-street, E.C.*
- 1880 Severn, H. Augustus, Esq. 9, *Earl's-court-square, S.W.*
- 1853 P. Sevin, Charles, Esq. 155, *Fenchurch-street, E.C.*
- 1872 Sewell, Stephen A., Esq. 56, *Kensington-gardens-square, W.*
- 1867 Seymour, Alfred, Esq. 5, *Chesterfield-gardens, Mayfair, W.*
- 1872 Seymour,\* Admiral Sir F. Beauchamp, K.C.B.
- 1873 Seymour,\* Major-General W. H., C.B. *United Service Club, Pall-mall, S.W.*
- 1854 Shadwell,\* Admiral Sir Charles F. A., K.C.B., F.R.S. *Meadow-bank, Melksham, Wilts.*
- 1860 Shadwell,\* Lieut.-Colonel Lawrence.
- 1874 Shanks, Major Joseph G., R.M.L.I. *Plymouth, Devon.*
- 1856 Share,\* Staff-Commander James Masters, R.N. *Mutley-park, near Plymouth, Devonshire.*
- 1873 Sharp,\* Colin Kimber, Esq. *Belgrave-mansions, Grosvenor-gardens, S.W.*
- 1873 Sharp, Captain Cyril. 7, *Thurloe-square, S.W.*
- 1866 Sharp, Henry T., Esq. 8, *Park-lane, Mayfair, W.*
- 1861 Sharpe,\* William John, Esq.
- 1874 Shaw, C. Bousfield, Esq. 25, *Charles-street, St. James's; and 2, Essex-court, Temple.*
- 1876 Shaw, Geo., Esq. 7, *Garrick-street, W.C.; and Oakwood-house, Rostrevor, Ireland.*
- 1862 Shaw,\* John, Esq. *Finegand, Otago, New Zealand. Care of Messrs. Reith and Wilkie, Dunedin, Otago, N.Z. Per Messrs. Sampson Low and Co., 188, Fleet-street, E.C.*
- 1861 Shaw, John Ralph, Esq. *Arrowe-park, Birkenhead.*

Year of Election.		
1876		Shaw, W. Otho Nicholas, Esq.
1879		Shean, Arthur William Charles, Esq. 18, <i>Finsbury-circus, E.C.</i>
1870		Shearme,* Edward, Esq. 94, <i>Regent's-park-road, N.W.</i>
1874		Shelley, Edward, Esq. <i>Avington, Winchester.</i>
1868		Shelley,* Captain G. Ernest. 32, <i>Chesham-place, S.W.</i>
1867		Shepherd, Chas. Wm., Esq., M.A., F.Z.S. <i>Trotterscliffe, Maidstone.</i>
1878		Shepherd, James, Esq. 19, <i>Lancaster-gate, W.</i>
1879		Shepherd, Capt. William, R.E. <i>Brompton-barracks, Chatham.</i>
1860		Sheridan, H. Brinsley, Esq., M.P. 6, <i>Colville-gardens, Kensington-park, W.</i>
1863		Sheridan, Richard B., Esq. 39, <i>Grosvenor-place, S.W.</i>
1857		Sherrin, Joseph Samuel, Esq., LL.D., PH.D. <i>St. John's-college, Tufnell-park, N.</i>
1877		Shillinglaw, John Joseph, Esq. <i>Melbourne, Victoria. Care of Cashel Hoey, Esq., office of Agent-General of Victoria, 8, Westminster-chambers, S.W.</i>
1858		Shipley,* Conway M., Esq. <i>Twyford-moors, Winchester.</i>
1868		Shirley, Lionel H., Esq., C.E., &c. <i>Windham Club, S.W.; and 20, Great George-street, S.W.</i>
1871		Shoolbred,* James, Esq. 38, <i>Lancaster-gate, Hyde-park, W.</i>
1873		Short, Robert, Esq. <i>Dighton-lodge, Highbury-new-park, N.</i>
1872		Shuter,* William, Esq. 66, <i>Belsize-park-gardens, Haverstock-hill, N.W.</i>
1876		Sibley,* George, Esq., C.E. <i>The Mount, Whitehill, Caterham, Surrey.</i>
1879	p.	Sibree, Rev. James. <i>Care of T. H. Richardson, Esq., York-villa, Westhall-road, Lordship-lane, Dulwich, S.E.</i>
1876		Sidney, Capt. Fred. W., R.N.
1871		Sills,* Wm. Bernard, Esq.
1877		Siltzer, John, Esq. 4, <i>Cromwell-houses, South Kensington, S.W.</i>
1865		Silva,* Frederic, Esq. 97, <i>Westbourne-terrace, Hyde-park, W.</i>
1859		Silver, the Rev. Fred., M.A., F.R.A.S., F.G.S., F.L.S. <i>Rectory, Norton-in-Hales, Market Drayton, Salop.</i>
1859	C.	Silver,* Stephen Wm., Esq. 66, <i>Cornhill, E.C.; and 3, York-gate, Regent's-park, N.W.</i>
1878		Sim, Lieut.-Colonel Edward Coysgarne, R.E. <i>United Service Club, Pall-mall, S.W.</i>
1853		Simmons, Edw. R., Esq. <i>Nevill-house, Belgrave-terrace, Brighton.</i>
1848		Simmons,* General Sir John L. A., R.E., G.C.B. 36, <i>Cornwall-gardens, Kensington, S.W.</i>
1866		Simons, Henry M., Esq. <i>Tyersall-crescent, Wood-road, Sydenham-hill, S.E.</i>
1879		Simpson, Arthur T., Esq., C.E. 54, <i>St. George's-square, S.W.</i>
1864		Simpson, Frank, Esq.
1863	p.	Simpson,* William, Esq. 64, <i>Lincoln's-inn-fields, W.C.</i>
1878		Simson,* Alfred, Esq. 4, <i>Fairlie-place, Calcutta.</i>
1879		Singleton, Jas. Edw., Esq. 30, <i>Lord-street, Barrow-in-Furness.</i>
1858		Skelmersdale, Right Hon. Edward, Lord. <i>Lathom-park, Ormskirk, Lancashire.</i>

Year of Election.		
1875	P.	Skertchly, Joseph A., Esq. 189, <i>Glenarm-road, Clapton-park, E.</i>
1873		Skilbeck, Jno. Hy., Esq. <i>The Hollies, Snaresbrook, Leytonstone, E.</i>
1866		Skinner, John E. H., Esq. 3, <i>Dr. Johnson's-buildings, Temple, E.C.</i>
1863		Skrine, Henry D., Esq. <i>Warleigh-manor, near Bath.</i>
1871		Slade, Henry, Esq., Fleet-Surgeon, R.N. <i>Army and Navy Club, S.W.; and Royal Western Yacht Club, Plymouth.</i>
1870	P.	Sladen, Col. E. B. <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1861		Sladen, Rev. Edward Henry Mainwaring. <i>The Gore, Bournemouth.</i>
1872		Smale, Sir John (Chief Justice, Hong-Kong). 45, <i>Abingdon-villas, Kensington, W.</i>
1865		Smedley, Joseph V., Esq., M.A. <i>Oxford and Cambridge Club, S.W.; and 34, St. George's-road, Kilburn.</i>
1871		Smetham, John Osborne, Esq. <i>King's Lynn, Norfolk.</i>
1880		Smith, Alfred John, Esq. 94, <i>Lansdowne-road, South Lambeth, S.W.</i>
1860		Smith,* Augustus Henry, Esq. <i>The Ridge, Bitterne, Southampton.</i>
1875		Smith,* B. Leigh, Esq., M.A. <i>Oxford and Cambridge Club, Pall-mall, S.W.</i>
1876		Smith, Bridgman, Esq. 27, <i>Lloyd-square, W.C.</i>
1871		Smith, Major C. B. Euan, C.S.I. (H.M. Consul, Muscat). 14, <i>St. James's-square, S.W. Care of Messrs. King and Co., Cornhill, E.C.</i>
1859		Smith, Edward, Esq. <i>Windham Club, S.W.</i>
1877		Smith, E. Louis T., Esq. <i>Richmond-house, Hounslow.</i>
1873	P.	Smith, F. Porter, Esq., M.B. <i>Shepton Mallet, Somersetshire.</i>
1878		Smith,* George, Esq., LL.D. <i>Serampore-house, Napier-road, Edinburgh.</i>
1871		Smith, Geo. Fereday, Esq., M.A., J.P., &c. <i>Grovehurst, Tunbridge Wells.</i>
1873		Smith, Griffiths, Esq. 7, <i>Endsleigh-street, Twistock-square, W.C.</i>
1865		Smith, Guildford, Esq. 63, <i>Charing-cross, S.W.</i>
1861		Smith, Jervoise, Esq. 47, <i>Belgrave-square, S.W.</i>
1876		Smith, J. L. Clifford, Esq. 9, <i>Amyand-park-road, Twickenham.</i>
1879		Smith, John, Esq. <i>Gravel-mount, Retford, Notts.</i>
1861		Smith,* Joseph Travers, Esq. 25, <i>Throgmorton-street, E.C.</i>
1857		Smith, Colonel Philip (Grenadier Guards). 6, <i>James-street, Buckingham-gate, S.W.</i>
1874		Smith,* R. Barr, Esq. <i>Torrens-park, Adelaide, S. Australia.</i>
1868		Smith,* Major Robert M., R.E. <i>Teheran.</i>
1874		Smith, Rupert, Esq. <i>Highfield, West Bromwich.</i>
1841		Smith,* Thomas, Esq.
1859		Smith,* W. Castle, Esq. 1, <i>Gloucester-terrace, Regent's-park, N.W.</i>
1859		Smith, Right Hon. William Henry, M.P. 2, <i>Hyde-park-street, W.</i>
1875		Smith, Wm. Hy., Esq. <i>Care of Messrs. Allan Bros. and Co., James-street, Liverpool.</i>
1875		Smith, William Howarth Glynn, Esq. 46, <i>Parliament-street, S.W.</i>
1857		Smith-Bosanquet,* Horace, Esq. 38, <i>Queen's-gate, South Kensington, S.W.</i>
1869		Smyth, Colonel Edmund. <i>Welwyn-grange, Herts.</i>
1869	C.	Smyth,* Warington, Esq., F.R.S. 5, <i>Interness-terrace, W.</i>

Year of Election.		
1850		Smythe,* Lieut.-General William J., R.A., F.R.S. <i>Athenæum Club, S.W.</i>
1872		Snooke, William, Esq. 20, <i>Northampton-park, Canonbury, N.</i>
1876		Solbé, Edward, Esq. <i>Broomfield, Freeland-road, Bromley, Kent.</i>
1879		Solomon, C. Edward, Esq. <i>Care of Messrs. White and Holmes, 20, Mildmay-chambers, Bishopsgate-street, E.C.</i>
1865		Solomons,* Hon. George. <i>Jamaica.</i>
1839	C.	Somers,* Right Hon. Charles, Earl. 4, <i>Chesterfield-gardens, W.; Eastnor-castle, Herefordshire; and The Priory, Reigate, Surrey.</i>
1862		Somerset, Capt. Leveson E. H., R.N. <i>Care of Messrs. Chard, 3, Clifford's-inn, Fleet-street, E.C.</i>
1876		Somerville, Dr. Thomas, LL.D. <i>Hawthorn-hall, Wilmslow, Cheshire.</i> <sup>1</sup>
1878		Soulsby, William Jameson, Esq. <i>Mansion-house, E.C.</i>
1860	p.	Southesk, James Carnegie, Earl of, K.T. <i>Kinnaird-castle, Brechin, N.B.</i>
1860		Southey,* James Lowther, Esq. <i>H.M.S. 'Crocodile,' Portsmouth.</i>
1872	p.	Spalding, Major H. (104th Regiment).
1865		Spalding, Samuel, Esq. <i>South Darent, Kent.</i>
1874		Sparrow, William, Esq. <i>Albrighton-hall, Shrewsbury.</i>
1873		Spence, Jno. Berger, Esq., F.G.S., &c. <i>Erlington-house, Whalley-range, Manchester.</i>
1870		Spencer, Admiral the Hon. J. W. S. 5, <i>Portman-street, W.</i>
1874		Spencer, Walter, Esq. <i>Grove-end-lodge, Highgate-road, N.W.</i>
1878		Spice, Robert Paulson, Esq. 21, <i>Parliament-street, S.W.</i>
1867		Spicer, Edward, Esq. 19, <i>New Bridge-street, E.C.</i>
1874		Spicer, Jas., Esq. <i>The Harts, Woodford, Essex.</i>
1874		Spicer, Capt. Richard W. 3, <i>Chesham-place, Belgrave-square, S.W.</i>
1863		Spickernell, Dr. Geo. E., Principal of Eastman's Royal Naval Establishment, <i>Eastern-parade, Southsea.</i>
1830		Spitzly, John Henry, Esq. 9, <i>Grange-road, Canonbury, N.</i>
1855	C. p.	Spottiswoode,* William, Esq., F.R.S. 41, <i>Grosvenor-place, S.W.</i>
1858	p.	Spratt,* Rear-Admiral Thos. A. B., C.B., F.R.S. <i>Clare-lodge, Nevill-park, Tunbridge Wells, Kent.</i>
1866	p.	Spruce, Richard, Esq., PH.D. <i>Coneysthorpe, Malton, Yorkshire.</i>
1879		Spuhler, Lieut. Francois Alphonse. <i>Care of R. Martineau, Esq., 37, Regent's-park-road, N.W.</i>
1871		Square, William, Esq., F.R.C.S. 22, <i>Portland-square, Plymouth.</i>
1879		Stafford, Cromartie Leveson-Gower, Marquis of, M.P. <i>Stafford-house, St. James's, S.W.; and Dunrobin-castle, Golspie, Sutherlandshire.</i>
1853		Stanford, Edward, Esq. 55, <i>Charing-cross, S.W.</i>
1877		Stanford,* Edward, Esq., jun. 17, <i>Spring-gardens, S.W.</i>
1860		Stanhope,* Walter Spencer, Esq. <i>Cannon-hall, Barnsley, Yorkshire.</i>
1870		Stanley, Staff-Commander Henry J., R.N. <i>Admiralty Survey, Melbourne; and Hydrographic-office, Admiralty, S.W.</i>
1872		Stanley,* Walmsley, Esq., C.E. <i>Albert-house, West End, Esher, Surrey.</i>
1869		Stanton, Charles Holbrow, Esq. 65, <i>Redcliffe-gardens, S.W.</i>

Year of Election.	
1875	Stanton,* Edw. Wm., Esq., M.A. 5, <i>Verulam-buildings, Gray's-inn, W.C.</i>
1863	Stanton, George, Esq. <i>Coton-hill, Shrewsbury; and Conservative Club, S.W.</i>
1871	Stark, Wm. Emery, Esq. <i>Rydal-lodge, New-park-road, Brixton-hill.</i>
1870	Starling, Joseph, Esq. <i>Beresford-lodge, Dyke-road, Brighton.</i>
1868	Staveley, Major-Gen. Sir Charles, K.C.B. <i>United Service Club, S.W.</i>
1863	Staveley,* Miles, Esq. <i>Old Sleningsford-hall, Ripon.</i>
1869	Stebbing, Edward Charles, Esq. <i>National Debt Office, 19, Old Jewry, E.C.; and The Aspens, Sunbury.</i>
1880	Stedman, John, Esq. 4, <i>Thornhill-square, N.</i>
1879	Steel, Major-General James A. 73, <i>Cambridge-terrace, Hyde-park, W.</i>
1867	Steel, Major J. P., R.E. <i>Simla. Care of the Oriental Bank, 40, Threadneedle-street, E.C.</i>
1868	Steel, William Strang, Esq. 65, <i>Lancaster-gate, Hyde-park, W.</i>
1876	Steele, James Dickson, Esq. <i>H.M. Female Convict Prison, Woking, Surrey.</i>
1871	Stein, Hon. Robert. <i>Port Louis, Mauritius. Care of Messrs. Stein, and Co. 22, Basinghall-street, E.C.</i>
1870	Stenning, Charles, Esq. 3, <i>Upper Hamilton-terrace, N.W.</i>
1880	Stephen, St. John, Esq. 16, <i>Colville-terrace, Bayswater, W.</i>
1879	Stephens, Daniel Woolcott, Esq. <i>Truby-house, Woodford, E.</i>
1874	Stephens, Harold, Esq. <i>Finchley, N.W.</i>
1880	Stephens,* Henry Charles, Esq. <i>Avenue-house, Finchley, N.; and Scientific Club, Savile-row, W.</i>
1870	Stephens,* Thomas Wall, Esq. 112, <i>Queen's-gate, South Kensington, S.W.</i>
1876	Stephenson, Jno. Hunter, Esq. 3, <i>Newman's-court, Cornhill, E.C.</i>
1857	Stephenson, Sir R. Macdonald, C.E. 72, <i>Lancaster-gate, W.; and East-cottage, Worthing.</i>
1866	Stepney, A. K. Cowell, Esq. 6, <i>St. George's-place, Knightsbridge, S.W.</i>
1877	Sterndale, Robert A., Esq.
1869	Steuart, Colonel T. R. (Bombay Army). 31, <i>Linden-gardens, Notting-hill, W.</i>
1874	Stevens, George Richard, Esq. <i>Kurraljeen, Hong Kong.</i>
1880	Stevens, S. W., Esq. <i>Gloucester-house, Highgate.</i>
1876	Stevenson, Capt. Geo. St. Claire. <i>Waterden-road, Guildford.</i>
1877	Stevenson,* James, Esq. <i>Broomfield, Largs, N.B.</i>
1874	Steward, Major Edward H., R.E. <i>War-office, Whitehall, S.W.</i>
1869	Stewart, Major C. E. (Bengal Staff Corps). 51, <i>Redcliffe-square, S.W.</i>
1874	Stewart, Gilbert McLeod, Esq. <i>Palace-chambers, St. Stephen's, S.W.</i>
1876	Stewart, H., Esq. 39, <i>Bruton-street, W.</i>
1871	Stewart,* Major Herbert (3rd Dragoon Guards). <i>Binfield-house, Bracknell.</i>
1866	Stewart, Rev. Dr. James. <i>Lovedale, Alice, South Africa. Care of Robert Young, Esq., Offices of the Free Church of Scotland, Edinburgh.</i>
1860	Stewart,* Major J. H. M. Shaw (Royal Madras Engineers).
1874	Stewart, Robert, Esq. <i>Port Elizabeth, Cape of Good Hope. Care of the Standard Bank, 10, Clement's-lane, Lombard-street, E.C.</i>

Year of Election.		
1877		Stewart,* Robert, Esq.
1873		Stewart, Admiral Sir Wm. Houston, K.C.B. 50, <i>Warwick-square, S.W., and Admiralty, S.W.</i>
1870		Stilwell, Henry, Esq., M.D. <i>Moarcroft, Hillington, Uxbridge.</i>
1879		Stilwell, James, Esq. <i>Victoria-park, Dover.</i>
1875		Stirling, Arthur F. G., Esq. <i>Oxford and Cambridge Club, S.W.</i>
1875		Stirling,* J. Carolus, Esq. 79½ <i>Gracechurch-street, E.C.</i>
1863		Stirling, Sir Walter, Bart. 36, <i>Portman-square, W.</i>
1878		Stock, Collard Joseph, Esq. 21, <i>Grove-road, Highgate-road, N.W.</i>
1880		Stock, Eugene, Esq. 12, <i>Milner-square, N.; and Church Missionary Society, Salisbury-square, E.C.</i>
1860		Stocker, John Palmer, Esq. 93, <i>Oxford-terrace, Hyde-park, W.</i>
1879		Stockley, Henry Curtis, Esq. 78, <i>Gordon-road, Clapham, S.W.</i>
1845	C. p.	Stokes,* Vice-Admiral John Lort. <i>United Service Club, S.W.; and Scotchwell, Haverfordwest, Wales.</i>
1868		Stone, David H., Esq., Alderman. 7, <i>Bucklersbury, E.C.</i>
1874	p.	Stone, Octavius C., Esq. <i>Stoneygate-grove, Leicester.</i>
1867		Story,* Edwin, Esq., M.A. 88, <i>Oldfield-road, Stoke Newington, N.</i>
1877		Stott,* Rev. Samuel Walter, B.A. <i>York.</i>
1868		Stovin, Rev. Charles F. 59, <i>Warwick-square, S.W.</i>
1873		Stow, Geo. W., Esq. <i>Queen's Town, S. Africa.</i>
1866	C. p.	Strachey, Major-General Richard, R.E., C.S.I., F.R.S. <i>Stowey-house, Clapham-common, S.W.; and India-office, S.W.</i>
1880		Stratford, Martin, Esq.
1858		Stratford de Redcliffe, Right Hon. Stratford Canning, Viscount, K.G., G.C.B. <i>Frant-court, Tunbridge Wells.</i>
1864		Straton, Rev. N. D. J. <i>The Vicarage, Wakefield.</i>
1880		Straube, Albert A. L., Esq. 63, <i>South-hill-park, Hampstead, N.W.</i>
1879		Street,* Edmund, Esq. <i>Millfield-lane, Highgate-rise, N.</i>
1875		Streeter, Alfred, Esq. <i>Fir-villa, Chestnut-grove, New Malden, Surrey.</i>
1877		Streeter,* Edwin William, Esq. <i>The Mount, Primrose-hill-road, N.W.; and Callis-court, St. Peter's, Kent.</i>
1860		Strickland, Sir Edward, K.C.B., Commissary-General. <i>Care of Sir Chas. R. McGrigor, Bart., and Co., 25, Charles-street, St. James's-square, S.W.</i>
1868		Strode,* Alf. Rowland Chetham, Esq. <i>Dunedin, Otago, New Zealand.</i>
1875		Strong, Alfred, Esq. 7, <i>Burlington-road, St. Stephen's-square, Bayswater, W.</i>
1853		Strutt, George H., Esq., F.R.A.S. <i>Bridge-hill, Belper.</i>
1876		Stuart, Alexander, Esq. <i>Iridge-place, Hurst-green, Sussex.</i>
1873		Stuart, Lieut.-Gen. Charles. <i>Hoburne, Christchurch, Hants.</i>
1859		Stuart, Lieut.-Col. J. F. D. Crichton. 25, <i>Wilton-crescent, Belgrave-square, S.W.</i>
1875		Stuart,* James Meliss, Esq. <i>Oakenshaw, Upper Norwood.</i>
1876		Stuart,* Colonel S. Wilham. <i>Tempsford-hall, Sandy; and 36, Hill-street, W.</i>
1880		Stubbs,* Samuel, Esq. 263, <i>Hampstead-road, Mornington-crescent, N.W.</i>

Year of  
Election.

- 1873 Sturgeon, Wentworth, Esq. *Cocoa Tree Club, St. James's-street, S.W.*
- 1876 Sturman, Rev. M. C. T. 54, *Tulfourd-road, Camberwell, S.E.*
- 1872 Sturt, Henry, Esq., jun. 119, *Holland-road, Kensington, W.*
- 1872 Styau, Arthur, Esq., F.S.A. 28, *Norfolk-crescent, Hyde-park, W.*
- 1878 Suche, Dr. George, F.L.S.
- 1864 Sudeley, Lord. *Toddington-park, Winchcombe, Gloucestershire.*
- 1857 Sullivan, Rear-Admiral Sir Bartholomew J., R.N., K.C.B. *Bournemouth.*
- 1873 Sullivan, Sir Edw., Bart. 37, *Princes-gate, S.W.*
- 1865 Sullivan, Rear-Admiral Sir F. W., K.C.B., C.M.G.
- 1869 Summerhayes,\* William, Esq., M.D. *Holton, Burwash, Sussex.*
- 1862 Surridge, Rev. Henry Arthur Dillon. M.A. *Bowdon, Altrincham.*
- 1862 Surtees, Colonel Charles Freville. *Chalcott-house, Long Ditton, Surrey.*
- 1873 Sutherland, Geo., Esq. *Arboretum-square, Derby.*
- 1861 Sutherland,\* George Granville William, Duke of, K.G., F.R.S. *Stafford-house, St. James's-palace, S.W.*
- 1869 Sutherland, Robert, Esq. *Egham-rise, Surrey.*
- 1869 Sutherland, Thomas, Esq. *Bute-house, 167, Cromwell-road, S.W.*
- 1874 Sutton, John Manners, Esq. *Kilham-hall, Newark, Notts.*
- 1879 Sutton, Martin J., Esq. *Sutherland's, Whitley, Reading.*
- 1875 Swain, Edward, Esq. *Three Counties Asylum, Stotfold, Baldock.*
- 1876 Swaine, Capt. Leopold Victor. 14, *Queen's-gate, S.W.*
- 1875 Swann, Rev. P. F., M.A. *Brandsby, Easingwold, Yorkshire.*
- 1879 Swanzy, Francis, Esq. 122, *Cannon-street, E.C.*
- 1875 Swart, Hon. N. J. R. *Care of J. J. Pratt, Esq., 79, Queen-street, Cheapside, E.C.*
- 1862 Swinburne,\* Commr. Sir John, Bart., R.N. *Capheaton, Newcastle-on-Tyne.*
- 1871 Syme, Henry, Esq. 9, *The Drive, Hove, Brighton.*
- 1864 Symonds, F., Esq., M.D. *Beaumont-street, Oxford.*
- 1852 p. Synge,\* Colonel Millington H., R.E. *United Service Club, Pall-mall, S.W.*
- 1875 Szlumper, Jas. Weeks, Esq., C.E., F.G.S. *Aberystwyth.*
- 1852 Tagart, Courtenay, Esq. *Reform Club, Pall-mall, S.W.*
- 1859 Tagart, Francis, Esq. 199, *Queen's-gate, S.W.; and Old Sneed-park, near Bristol.*
- 1879 Tait, Matthew, Esq. *Heaton, Bradford, Yorkshire.*
- 1857 Tait,\* Robert, Esq. 14, *Queen Anne-street, W.*
- 1880 Takemura, Kingo. 16, *Longton-grove, Sydenham, S.E.*
- 1861 Talbot de Malahide, James Talbot, Lord, F.R.S. 15, *Chesterfield-street, May-fair, W.; Athenæum Club; and Malahide Castle, Co. Dublin.*
- 1877 Taubman, George Goldie, Esq. *Naval and Military Club, Piccadilly, W.*
- 1879 Tayler, Frank, Esq. 156, *Leadenhall-street, E.C.*



## List of Fellows of the

Year of Election.		
1861		Taylor, Commander A. Dundas, I.N. (Director of Marine Surveys), <i>Calcutta. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1873		Taylor, Charles, Esq. <i>Ealing-college, Ealing, W.</i>
1875		Taylor, C. A., Esq. <i>Downham Market, Norfolk.</i>
1878		Taylor, Rev. Charles Parbutt. <i>Severnside, Maisemore, Gloucester.</i>
1876		Taylor, Fras. Clement, Esq. <i>Summerleaze, East Harptree, near Bristol.</i>
1869		Taylor, George N., Esq. <i>The Mount, Sunning-hill, Staines.</i>
1865		Taylor, H. L., Esq. <i>Reform Club, S.W.; and 23, Phillimore-gardens, Kensington, W.</i>
1873		Taylor, J. Banks, Esq. 25, <i>Austin Friars, E.C.</i>
1865		Taylor, Rev. Jas. Hudson. 6, <i>Pyrland-road, Newington-green, N.</i>
1871		Taylor,* John, Esq. <i>The Rocks, Bath; and Booth-hall, Blackley, Lancashire.</i>
1863		Taylor, John, Esq. 110, <i>Fenchurch-street, E.C.</i>
1870		Taylor,* John Fenton, Esq. 20, <i>New-street, Spring-gardens, S.W.</i>
1854		Taylor,* John Stopford, Esq., M.D. 2, <i>Millbank-terrace, Anfield-road, Liverpool.</i>
1863		Taylor, Lieut.-Gen. R. C. H., C.B. 16, <i>Eaton-place, S.W.; and Carlton Club, S.W.</i>
1878		Taylor, Thomas, Esq. <i>Aston Rowant, Tittsworth, Oxfordshire.</i>
1864		Taylor, William Richard, Esq., Deputy-Commissary.
1875		Telfer, Commander Buchan, R.N., F.S.A. 14, <i>Sumner-place, Onslow-square, S.W.</i>
1876	P.	Temple, Lieut. Geo. T., R.N. <i>The Nash, near Worcester.</i>
1879		Temple, Lieut. R. C., B.S.C. <i>Ferozepore, Panjab; The Nash, near Worcester; and Naval and Military Club, Piccadilly.</i>
1865	C. p.	Temple, Sir Richard, Bart., G.C.S.I., C.I.E. <i>The Nash, near Worcester; and Athenæum Club, S.W.</i>
1857		Temple-West, Col. T.
1860		Templeton, John, Esq. 24, <i>Budge-row, E.C.</i>
1857	P.	Tennant, Professor James. 149, <i>Strand, W.C.</i>
1872		Terrero, Maximo, Esq. 88, <i>Belsize-park-gardens, N.W.</i>
1830		Thatcher,* Colonel.
1874		Thomas, Chas. Evan, Esq. 98, <i>Queen's-gate, S.W.</i>
1872		Thomas, James Lewis, Esq., F.S.A. <i>War-office, Horse-Guards; 26, Gloucester-street, Warwick-square, S.W.; and Thatched-House Club, St. James's-street, S.W.</i>
1865		Thomas, John Henwood, Esq. <i>East India Dept., Custom-house, E.C.</i>
1864		Thomas, J. R., Esq., Staff Assist. Surg. <i>Castle-hill, Fishguard, Pembrokeshire.</i>
1874		Thomas, R. Gerard de V., Esq., M.A. <i>Eythorne-house, Maidstone.</i>
1875		Thomas, Wesley Hy., Esq. <i>The Mount, Steephill, Ventnor.</i>
1878		Thomasson, E. S. Esq. " <i>Globe</i> " <i>Steel-works, Sheffield.</i>
1876		Thompson, Major H. (Bengal Staff Corps). <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>

Year of Election.		
1869		Thompson,* Henry Yates, Esq. 26A, <i>Bryanston-square, W.</i>
1874		Thompson, Thomas, Esq. (H.M. Vice-Consul, <i>Delagoa Bay</i> ).
1879		Thomson, Colonel George Cadogan. 21, <i>Holland-park-gardens, Uxbridge-road Bayswater, W.</i>
1863		Thomson, James, Esq. <i>Heusill, Hawkhurst, Kent.</i>
1863		Thomson, James Duncan, Esq. (Portuguese Consul). <i>St. Peter's-chambers, Cornhill, E.C.</i>
1866	p.	Thomson, John, Esq. 12, <i>Elgin-gardens, Effra-road, Brixton, S.W.</i>
1848	p.	Thomson,* J. Turnbull, Esq. (Surveyor-General of New Zealand). <i>Wellington, New Zealand.</i>
1861	p.	Thomson,* Ronald Ferguson, Esq.
1865	p.	Thomson, W. T., Esq.
1862		Thorne,* Augustus, Esq. <i>Belgrave-mansions, Grosvenor-gardens, S.W.</i>
1876		Thornhill, Capt. Jas. Alfred. <i>Bradbourne-villas, Bushey-hill, Camberwell.</i>
1867		Thornton, Edward, Esq., C.B. <i>Bank-house, Windsor.</i>
1847		Thornton, Rev. Thomas Cooke, M.A., M.R.I.A. <i>Brock-hall, near Weedon, Northamptonshire.</i>
1868		Thorold, Alexander W. T. Grant, Esq. 3, <i>Grosvenor-gardens, S.W.</i>
1877		Thorpe, Geo., Esq. 20, <i>Eastcheap, E.C.</i>
1871		Thorpe, Wm. Geo., Esq., F.G.S. <i>Gloucester-house, Larkhall-rise, S.W.; and Barton's-house, Ipplepen, Newton Abbot, Devon.</i>
1877		Thring, Sir Henry, K.C.B. 2, <i>New-street, Spring-gardens, S.W.</i>
1859	C.	Thuillier, Lieut.-Gen. Sir H. L., C.S.I., F.R.S. 32, <i>Cambridge-terrace, Hyde-park, W.</i>
1872		Thuillier, Major Henry R., R.E. 8, <i>Montagu-terrace, Friar's-stile-road. Richmond, S.W.</i>
1865		Thurburn,* C. A., Esq. 16, <i>Kensington-park-gardens, Notting-hill, W.</i>
1861		ThurLOW, The Right Hon. Lord. <i>Dunphail, Forres, N. B.</i>
1874		Thwaites, Capt. Joseph. 5, <i>Washington-terrace, Southampton.</i>
1877		Tietkins, W. H., Esq. <i>Kinnaird-castle, Brechin, Forfarshire.</i>
1879		Tillbrook, Rev. W. John. <i>Comberton, near Cambridge.</i>
1874		Tighe, Col. Fred. <i>The Priory, Christchurch, Hants.</i>
1878		Timmins, Samuel, Esq., J.P., F.S.A., &c. <i>Elvetham-lodge, Birmingham.</i>
1872		Tinline, George, Esq. 17, <i>Prince's-square, Bayswater, W.</i>
1874		Tinné,* J. Ernest, Esq. <i>Briarley, Aigburth, near Liverpool.</i>
1839		Tinné,* John A., Esq. <i>Briarley, Aigburth, near Liverpool.</i>
1873		Tipping, George B., Esq. <i>Coombe-lodge, Kingston-hill, Surrey.</i>
1876		Tizard, Staff-Commander T. H., R.N. <i>Hydrographic-office, Admiralty, S.W.</i>
1877		Todd, Arthur, Esq. 125, <i>Triton Ville-road, Sandymount, Dublin.</i>
1879		Todd, George, Esq. <i>Auckland-lodge, Blackheath, S.E.</i>
1865		Todd, Rev. John W., D.D. <i>Tudor-hall, Forest-hill, Sydenham, S.E.</i>
1880		Tokoogawa,* Iyesato. 16, <i>Longton-groze, Sydenham, S.E.</i>
1880		Toogood, Octavius, Esq. 73, <i>Cornwall-gardens, South Kensington, S.W.; and Conservative Club, St. James's-street, S.W.</i>

Year of Election.	
1877	Tomlin, John Hewitt, Esq. <i>Wesley-terrace, Branley, Leeds.</i>
1853	Tomline, George, Esq. 1, <i>Carlton-house-terrace, S. W.</i>
1873	Tomlinson, John, Esq. <i>Malpas, Cheshire.</i>
1875	Tomlinson, Walter, Esq., B.A. 3, <i>Richmond-terrace, Whitehall, S.W.</i>
1877	Tomlinson,* W. E. M., Esq., M.A. 3, <i>Richmond-terrace, Whitehall, S.W.; and Athenæum Club, S.W.</i>
1866	Torrens, Sir Robert Richard, K.C.M.G. 12, <i>Chester-place, W.; and The Cott, Holm, near Ashburton, South Devon.</i>
1877	Torry,* Lieut. Harold J. B. <i>Hanover-square Club, W.</i>
1878	Tosswill, Capt. Robert George Davis. <i>Canterbury, New Zealand. Care of Vicomte Duprat, 10, St. Mary Axe, E.C.</i>
1875	Townshend, Capt. F. French (2nd Life Guards). <i>Arthur's Club, St. James's-street, S.W.</i>
1859	Townshend, Capt. John, R.N. 2, <i>Fernside-villas, New Wandsworth.</i>
1846	Towry,* George Edward, Esq.
1873	Towse, John Wrench, Esq. <i>Fishmongers'-hall, London-bridge, E.C.</i>
1858	Towson, J. Thomas, Esq. 47, <i>Upper Parliament-street, Liverpool.</i>
1864	p. Toynbee,* Capt. Henry. 12, <i>Upper Westbourne-terrace, W.</i>
1863	Tozer,* Rev. H. F., M.A. <i>Exeter College, Oxford.</i>
1865	Travers,* Arch., Esq. 28A, <i>Addison-road, Kensington, W.</i>
1876	Travers, Lieut.-Gen. James, V.C. <i>Care of Messrs. King and Co., 65, Cornhill, E.C.</i>
1859	Tremlett, Rev. Francis W., M.A., D.C.L., PH.D. <i>Belsize-park, Hampstead, N.W.</i>
1879	Tremlett, Rear-Admiral Francisco S. <i>Belle Vue, Tunbridge Wells.</i>
1865	Trench,* Major the Hon. Le Poer, R.E. 3, <i>Hyde-park-gardens, W.; and Ordnance Survey-office, Pimlico, S.W.</i>
1863	Trestrail, Rev. Frederick. <i>St. John's-road, Newport, Isle of Wight.</i>
1872	Treuenfeld, Richard von F., Esq. 12, <i>Queen Anne's-gate, Westminster, S.W.</i>
1862	Trevelyan, Sir Charles Edward, Bart. K.C.B. 8, <i>Grosvenor-crescent, S.W.</i>
1864	Trimmer, Edmund, Esq. 75, <i>Cambridge-terrace, Hyde-park, W.</i>
1875	Trinder, Hy. Wm., Esq. 135, <i>Harley-street, W.</i>
1867	Tritton, Joseph Herbert, Esq. 54, <i>Lombard-street, E.C.</i>
1871	Trivett, Captain John Fredk., R.N.R. <i>The Homestead, Hackney-common, N.E.</i>
1878	Trollope, Anthony, Esq. 39, <i>Montague-square, W.C.</i>
1876	Trotter,* Coutts, Esq. <i>Athenæum Club, Pall-mall, S.W.</i>
1869	6. p. Trotter, Major Henry, R.E. <i>Care of Messrs. Richardson and Co., 13, Pall-mall, S.W.</i>
1872	Trotter, Captain J. Moubray. <i>Care of Messrs. Haldanes and Brookman, 17, Charlotte-street, Edinburgh.</i>
1874	Trotter,* William, Esq. 11, <i>Hertford-street, Mayfair, W.</i>
1870	Trutch, J. W., Esq., C.M.G. <i>Victoria, British Columbia. Care of Bank of British Columbia, 28, Cornhill, E.C.</i>

Year of Election.		
1867		Tryon, Captain George, R.N., C.B. 5, <i>Eaton-place, S.W.</i> ; and <i>Army and Navy Club, S.W.</i>
1862	p.	Tuckett, Francis Fox, Esq. <i>Frenchay, near Bristol.</i>
1865		Tuckett, Philip D., Esq. <i>Southwood-lawn, Highgate, N.</i>
1852		Tudor, Edward Owen, Esq., F.S.A. 1, <i>Portugal-street, Grosvenor-square, W.</i>
1857		Tudor, Henry, Esq. 12, <i>Portland-place, W.</i>
1876		Tufnell, Wm., Esq. 6, <i>Eaton-square, S.W.</i> ; and <i>Hatfield-place, Hatfield-Peveral.</i>
1864		Turnbull, George, Esq., C.E., F.R.A.S. <i>Rosehill, Abbots Langley, Herts.</i>
1878		Turnbull,* Walter, Esq. <i>Mount Henley, Sydenham-hill, S.E.</i>
1870		Turner, Lieut.-General Henry Blois (Bomb. Eng.). 131, <i>Harley-street, W.</i>
1874		Turner, H. G., Esq. (Madras Civil Service). 14, <i>St. James's-square, S.W.</i>
1874		Turner, Jos. Edward, Esq. 30, <i>King-street, Cheapside, E.C.</i>
1863		Turner, Thomas, Esq. 36, <i>Harley-street, W.</i>
1878		Turton, Lieut. W. H., R.E. <i>Care of Mrs. Hughes, Devon, Lordship-lane, S.E.</i>
1867		Tweedie, Major Michael, R.A. 101, <i>Belgrave-road, S.W.</i> ; and <i>Army and Navy Club, S.W.</i>
1865		Tweeddale, The Most Hon. The Marquis of. 25, <i>St. James's-place, S.W.</i>
1864		Twentyman,* A. C., Esq. <i>Castlecroft, near Wolverhampton.</i>
1863		Twentyman, William H., Esq. <i>Racensworth, St. John's-wood-park, N.W.</i>
1849		Twiss, Sir Travers, D.C.L., F.R.S. 3, <i>Paper-buildings, Temple, E.C.</i>
1874		Twite, Charles, Esq. <i>Castle-house, St. Agnes, Scorrier, Cornwall.</i>
1858	p.	Twyfard, Captain A. W., 21st Hussars. <i>Governor, York Castle.</i>
1865		Tyer, Edward, Esq., C.E., F.R.A.S. 4, <i>Old-street, Goswell-road, E.C.</i>
1862		Tyler,* George, Esq. 24, <i>Holloway-place, Holloway-road, N.</i>
1873		Tyler, W. James, Esq. 106, <i>Cannon-street, E.C.</i>
1876		Ulliyett, Henry, Esq., B.Sc. <i>Dover-road, Folkestone.</i>
1862		Underhill, Edward Bean, Esq., LL.D. <i>Derwent-lodge, Thurlow-road, Hampstead, N.W.</i>
1868		Unwin, Howard, Esq., C.E. <i>Oxford-court, 109A, Cannon-street, E.C.</i>
1877		Vacher,* E. P., Esq. <i>Oak-hill, Surbiton.</i>
1844		Vacher,* George, Esq. <i>Oak-hill, Surbiton.</i>
1872		Vallentin,* James R., Esq. 55, <i>Cow-cross, E.C.</i>
1874		Valentine, William J., Esq.
1878		Van Campen, Samuel Richard, Esq. 137, <i>East 21st Street, Gramercy-park, New York, U.S.</i>

*List of Fellows of the*

Year of Election.		
1862		Vander Byl,* P. G., Esq.
1876		Vanrenen, Lieut.-Col. Adrian Deneys (Bengal Staff Corps). 24, <i>Lansdowne-road, Notting-hill, W.</i>
1875		Vans-Agnew, Robert, Esq. <i>Carlton Club, S.W.; and Barnbarrock, Wigton-shire, N. B.</i>
1879		Vaughan, Right Rev. Herbert (Bishop of Salford). <i>Bishop's-house, Salford.</i>
1856		Vaughan,* James, Esq., F.R.C.S. <i>Builth, Breconshire.</i>
1880		Vause, Richard, Esq. <i>Durban, Natal. Care of Messrs. White and Holmes, 20, Mildmay-chambers, Bishopsgate-street, E.C.</i>
1852		Vavasour,* Sir Henry M., Bart. 8, <i>Upper Grosvenor-street, W.</i>
1855		Vavasseur, James, Esq. <i>Knockholt, near Sevenoaks, Kent.</i>
1880		Venables, Gilbert, Esq., B.A. 1, <i>Adam-street, Adelphi, W.C.</i>
1871		Vereker, Lieut.-Col. the Hon. Charles Smyth. <i>Junior United Service Club, S.W.</i>
1863	p.	Vereker,* The Hon. H. P. LL.D. (H.M. Consul at Charante). 1, <i>Portman-square, W.</i>
1862		Verner, Edward Wingfield, Esq.. <i>The Aske, Bray, Ireland.</i>
1862		Verney,* Commr. Edmond H., R.N. <i>Rhianva, Bangor, North Wales.</i>
1837	C.	Verney,* Sir Harry C., Bart., M.P., F.R.A.S. <i>Travellers' Club, S.W.; and Claydon-house, Bucks.</i>
1852		Verulam, Right Hon. James Walter, Earl of. <i>Gorhambury, near St. Albans; Barry-hill, Surrey; and Messing-hall, Essex.</i>
1879		Vickers, James Muschamp, Esq. <i>Mitcham-groce, Mitcham.</i>
1874		Vincent,* Capt. Chas (late I.N.). 3, <i>Shrewsbury-road, Westbourne-park, W.</i>
1857		Vincent, John, Esq. 2, <i>Ulster-terrace, Regent's-park, N.W.</i>
1865		Vincent,* M. C., Esq., Professor of Economic Geology and Metallurgy; Inspector of Mines, &c. <i>Cincinnati, U. S.; and 127, Strand, W.C.</i>
1871		Vine, Staff-Comm. Wm. W., R.N. <i>Care of Messrs. Hallett and Co., St. Martin's-place, W.</i>
1858		Vines, William Reynolds, Esq., F.R.A.S. <i>Care of Sydney H. Vines, Esq., Christ's College, Cambridge.</i>
1874		Viney, Rev. Josiah. <i>Fernwood, Highgate, N.</i>
1872		Vivian, Hon. H. Crespigny, C.B. <i>Foreign-office, S.W.</i>
1863		Vivian, Major Quintus. 17, <i>Chesham-street, Belgrave-square, S.W.</i>
1876		Vivian, Capt. Ralph. 24, <i>Grosvenor-street, W.</i>
1876		Vyse, Griffin William, Esq. <i>Allison-groce, Dulwich, S.E.</i>
1863		Wade, R. B., Esq. 13, <i>Seymour-street, Portman-square, W.</i>
1863		Wade, Sir Thos. F., K.C.B., H.B.M. Minister Plenipotentiary, Envoy Extraordinary, and Superintendent of Trade. <i>Peking, China. Care of R. B. Wade, Esq., 13, Seymour-street, Portman-square, W.</i>

Year of Election.		
1877		Wadham,* Edward, Esq., J.P. <i>Milwood Dalton, Lancashire.</i>
1873		Wagner,* Henry, Esq., M.A. 13, <i>Half-Moon-street, Piccadilly, W.</i>
1853		Wagstaff,* William Racster, Baron, M.D., M.A.
1876		Wainwright, Chas. Jas., Esq. <i>Elmhurst, East End, Finchley, N.; and 251, High Holborn, W.C.</i>
1880		Wainwright, Lieut. Laurence A. <i>Berwick-Basset-vicarage, Swindon, Wilts.</i>
1867		Waite,* Rev. John.
1871		Wakley, Thos. Finsbury Septimus, Esq., C.E. <i>College-terrace, Guernsey.</i>
1874		Walburn, Edmund, Esq., M.A., Principal of Grosvenor College. 366, <i>Brixton-road, S.W.</i>
1874		Walkem, Hon. Geo. Anthony. <i>Victoria, British Columbia.</i>
1870	p.	Walker,* Albert, Esq. <i>Auckland Club, New Zealand.</i>
1875		Walker, Capt. Arthur Campbell (Royal Body Guard). <i>Army and Navy Club, Pall-mall, S.W.</i>
1862		Walker, Major-General C. P. Beauchamp, C.B. 97, <i>Onslow-square, S.W.; and United Service Club, S.W.</i>
1861		Walker, Edward Henry, Esq. (H.M. Consul at <i>Corunna</i> ). <i>Care of Messrs. Drummond, Charing-cross.</i>
1879		Walker, Colonel Forestier W. E., C.B. <i>The Manor-house, Bushey, Kent; and Guards' Club, Pall-mall, S.W.</i>
1863		Walker,* Frederick John, Esq. <i>The Priory, Bathwick, Bath.</i>
1872		Walker, Capt. J. Campbell (Madras Staff Corps). <i>Care of Messrs. Grindlay and Co., 55, Parliament-street, S.W.</i>
1859		Walker,* Major-General James T., C.B., F.R.S., Royal Engineers (Supt. Gt. Trig. Survey of India). <i>Dehra Doon, India. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.</i>
1873		Walker, John, Esq. 351, <i>Brixton-road, S.W.</i>
1861		Walker,* John, Esq.
1858		Walker,* Lieut.-Colonel John (H.M.'s 66th Foot). <i>Broom-hill, Colchester.</i>
1871	p.	Walker,* Capt. J. B. <i>Care of Messrs. Elder, Dempster, and Co., 48, Castle-street, Liverpool; and Old Calabar, near Bonny, West Africa.</i>
1864	p.	Walker, R. B. N., Esq. <i>Wanderers' Club, Pall-mall, S.W.</i>
1874		Walker, Robert, Esq. 39, <i>Lombard-street, E.C.</i>
1861		Walker, Rev. William. <i>School-house, Reading.</i>
1866		Walker, William, Esq., F.S.A. 48, <i>Hildrop-road, Tufnell-park, N.</i>
1874		Walker, W. Fredk., Esq. <i>Moore-park-villas, Waltham-green, S.W.</i>
1868		Walkinshaw, William, Esq. <i>Hartley-grange, Winchfield, Hants.</i>
1854	p.	Wallace,* Alfred Russel, Esq. <i>Waldron-edge, Duppas-hill, Croydon.</i>
1861		Wallace, Rev. Charles Hill, M.A. 3, <i>Harley-place, Clifton, Bristol.</i>
1879		Waller, Gerald, Esq. <i>Hoe-street, Walthamstow, Essex.</i>
1864		Waller, Rev. Horace. <i>The Rectory, Twywell-by-Thrapston, Northamptonshire.</i>
1863	p.	Wallich, George C., Esq., M.D. <i>Swinton, 3, Christchurch-road, Roupell-park, Brixton, S.W.</i>
1872		Wallroth,* Chas. Henry, Esq. <i>Woodclyffe, Chislehurst.</i>

Year of Election.		
1874		Walls, William, Esq. 2, <i>Belhaven-terrace, Glasgow.</i>
1876		Walpole, Lieut. Robert Horace, R.N. <i>Rainthorpe, near Norwich; and 4, Dean-street, Park-lane, W.</i>
1863		Walpole, Rt. Hon. Spencer, M.P., F.R.S. 109, <i>Eaton-square, S.W.</i>
1878		Walrond, Sir J. W., Bart. 54, <i>Grosvenor-street, W.</i>
1879		Walter, Capt. Fred. Edw., R.H.A. <i>St. George's Barracks, Bermuda.</i>
1853		Walter, Henry Fraser, Esq. <i>Papplewick-hall, near Nottingham.</i>
1873		Waltham,* Edward, Esq. <i>Watcomb-house, St. Anne's-place, Streatham-hill, S.W.</i>
1863		Walton, J. W., Esq. 41, <i>Great Marlborough-street, W.</i>
1864		Walton, R. G., Esq., C.E. <i>Bombay.</i>
1877		Ward, Charles, Esq. <i>Newcastle, Natal, South Africa. Care of Dr. H. Buss, Blenheim-lodge, Turnham-green, W.</i>
1876		Ward,* Christopher, Esq. <i>Saville-place, Halifax.</i>
1853		Ward,* George, Esq.
1874		Ward, John, Esq. <i>Lenox-vale, Belfast. Care of J. A. Rose, Esq., 11, Salisbury-street, Strand, W.C.</i>
1878		Ward, John Edward, Esq. <i>Elm-house, Grosvenor-road, S.W.</i>
1868	p.	Ward, Captain the Hon. Wm. John, R.N., A.D.C. 44, <i>Charing-cross, S.W.</i>
1875		Warden, Edmund M., Esq. <i>Wyberlye, Burgess-hill, Sussex.</i>
1862		Wardlaw, John, Esq. 44, <i>Prince's-gardens, Hyde-park, S.W.</i>
1876		Warner, Rev. Geo. Townsend. <i>Newton-college, S. Devon.</i>
1877		Wainer,* J. H. B., Esq. <i>Quorn-hall, Loughborough; and Conservative Club, S.W.</i>
1876		Warrand, Colonel W. E., R.E. <i>The Bught, Inverness.</i>
1872		Warre, Rev. Edmond, M.A. <i>Eton College.</i>
1869		Warre, Lieut.-General H. J., C.B.
1874	p.	Warren, Lieut.-Col. Charles, R.E., C.M.G. <i>Brompton-barricks, Chatham.</i>
1869		Warren, Charles, Esq. 17, <i>Hanover-street, Peckham, S.E.</i>
1862		Warren, Major Richard Pelham. <i>Worting-house, Basingstoke.</i>
1876		Waterfield,* O. C., Esq. <i>Temple-grove, East Sheen.</i>
1867		Waterhouse, George Marsden, Esq. <i>Care of Messrs. Morrison and Co., 4, Fenchurch-street, E.C.</i>
1874		Waterhouse,* Major Jas., Bengal Staff Corps (Assistant Surveyor-General of India). <i>Surveyor-General's-office, Calcutta. Care of Messrs. Trübner and Co., 59, Ludgate-hill, E.C.; and 40, Hamilton-terrace, N.W.</i>
1875		Waters, J. H. Ernest, Esq.
1874		Waters, T. J., Esq.
1874		Watherston, Rev. Jno. Dundas. <i>The Lecturer's House, Monmouth.</i>
1862		Watney, John, Esq. 4, <i>Ironmonger-lane, E.C.</i>
1875	p.	Watson, Capt. Chas. Moore, R.E. 25, <i>Fitzwilliam-place, Dublin.</i>
1859		Watson, James, Esq. 24, <i>Endsleigh-street, W.C.</i>
1860		Watson, James, Esq. <i>Langley-house, Langley, Bucks.</i>
1874		Watson, Sir James. 9, <i>Woodside-terrace, Glasgow.</i>

Year of Election-	
1880	Watson, James L., Esq. <i>Killinghall, Ripley, Yorkshire.</i>
1876	Watson, Jno. Gibson, Esq. 20, <i>Clanricarde-gardens, Hyde-park, W.</i>
1861	Watson, John Harrison, Esq. 28, <i>Queensborough-terrace, Kensington-gardens, W.</i>
1875	Watson, Lieut. Joseph, R.N.R. 22, <i>Bancroft-road, Mile-end-road, E.</i>
1872	Watson, Robert, Esq. <i>Falcott-house, North-hill, Highgate, N.</i>
1867	Watson, Robert Spence, Esq. <i>Moss Croft, Gateshead-on-Tyne.</i>
1870	Watson, Thos., Esq. (Portuguese Vice-Consul, <i>Cape Town</i> ). <i>Care of J. R. Thomson and Co., St. Peter's-chambers, E.C.</i>
1880	Watson,* William, Esq., F.M.S. <i>Care of Capt. Inglis, 8, Water-street, Liverpool.</i>
1876	Watson, Wm. Livingstone, Esq. <i>Oriental Club, Hanover-square, W.</i>
1871	Watt, Robert, Esq., C.E. <i>Ashley-avenue. Belfast.</i>
1878	Watts, Rev. Arthur. <i>Training-college, Durham.</i>
1872	Watts, H. Cecil, Esq. <i>Lindfield-house, Lindfield, Surrey.</i>
1872	Watts, John, Esq. <i>Eastington-house, Stonehouse, Gloucestershire.</i>
1874	Waugh, Fras. Gledstanes, Esq., M.A. <i>Oxford and Cambridge Club, Pall-mall, S.W.</i>
1879	Wavell, Lieut-Col. A. H. 102, <i>Piccadilly, W.</i>
1867	Waveney, Lord, F.R.S., &c. 7, <i>Audley-square, W.; and Flinton-hall, Harleston.</i>
1872	Webb, Geo. P., Esq. <i>Junior Athenæum Club, Piccadilly, W.</i>
1877	Webb, Captain H. G. <i>Norton-barracks, Worcester; and Army and Navy Club, S.W.</i>
1876	Webb, J. C., Esq., M.D. 42, <i>Lower Belgrave-street, S.W.</i>
1875	Webb, Locock, Esq., Q.C. 1, <i>Hanover-terrace, Notting-hill, W.</i>
1858	Webb,* Capt. Sydney. <i>Riversdale, Twickenham.</i>
1862	Webb,* William Frederick, Esq. <i>Newstead Abbey, Notts; and Army and Navy Club, Pall-mall, S.W.</i>
1865	Webster, Alphonsus, Esq. 41, <i>Mecklenburgh-square, W.C.</i>
1866	Webster, George, Esq.
1874	Webster, James Hume, Esq. 14, <i>Chapel-street, Park-lane, W.</i>
1879	Webster, Robert G., Esq. <i>Library-chambers, Garden-court, Temple, E.C.</i>
1874	Wedd, George, Esq. 51, <i>Queen's-gardens, Hyde-park, S.W.</i>
1875	Weedow, Joseph, Esq. <i>Darnhall Grammar-school, Winsford, Cheshire.</i>
1860	Weguelin, Thomas Matthias, Esq., M.P. 57½, <i>Old Broad-street, E.C.</i>
1872	Weise, Jno., Esq. 103, <i>St. George's-road, Pimlico, S.W.</i>
1874	Weiss, Foveaux, Esq. 33, <i>Chester-terrace, Regent's-park, N.W.</i>
1878	Weiss, Hubert Foveaux, Esq. 33, <i>Chester-terrace, Regent's-park, N.W.</i>
1878	Welby, Reginald Earle, Esq. 95, <i>Jermyn-street, S.W.</i>
1851	Weller, Edward, Esq. 34, <i>Red-lion-square, W.C.</i>
1873	Wellings, Henry, Esq.
1853	C. Wellington,* Arthur Richard, Duke of, Major-General, K.G., D.C.L. <i>Apsley-house, W.; and Strathfieldsaye, Hampshire.</i>
1870	Wells,* Arthur, Esq. <i>Nottingham.</i>
1864	Wells, Sir Mordaunt, late Chief Puisne Judge, Bengal. 4, <i>Victoria-street, S.W.</i>



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- 1870 West, Raymond, Esq. (Bomb. Civ. Service).
- 1873 West, William Nowell, Esq. 30, *Montagu-street, Russell-square, W.C.*
- 1872 Westendarp, Charles H., Esq. 19, *Stanley-crescent, Kensington, W.*
- 1873 Western, W. T., Esq. 11, *Montague-villas, Richmond.*
- 1875 Westgarth, Wm., Esq. 10, *Bolton-gardens, South Kensington, S.W.*
- 1863 Westlake,\* John, Esq. 16, *Oxford-square, W.*
- 1853 Westmacott, Arthur, Esq. *Athenæum Club, S.W.*
- 1874 Westmacott, E. Vesey, Esq. *Haddenham, Ely.*
- 1852 Weston, Alex. Anderdon, Esq., M.A. 74, *Queen's-gate, S.W.*
- 1862 Westwood, John, Esq.
- 1830 Weyland,\* John, Esq., F.R.S. *Woodrising-hall, Norfolk.*
- 1878 Whalley, Daniel, Esq. 62, *Threadneedle-street, E.C.*
- 1866 C. Wharnccliffe, Right Hon. The Earl of. 15, *Curzon-street, W.*
- 1861 Wharton, Rev. J. C. *Junior Athenæum Club, Piccadilly, W.*
- 1874 Wharton, Robert, Esq. *Hurley, Great Marlow, Bucks.*
- 1876 Wharton,\* Commr. Wm. Jas. Lloyd, R.N. *H.M.S. 'Fawn.'*
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- 1879 Wheeler,\* Edward, Esq. *Care of A. Wheeler, Esq., Worcester-park-house, Surrey.*
- 1880 Wheeler, Stephen, Esq. *Allahabad. Care of Messrs. Allen, Brothers and Co., 12, Albion-place, London-wall, E.C.*
- 1869 Whichelow, Rev. James Shearer. 13, *Gore-crescent, Victoria-park, N.*
- 1853 Whinfield,\* Edward Wrey, Esq., B.A. *Severn-grange, Worcester.*
- 1867 Whitaker, Thomas Stephen, Esq. *Everthorpe-hall, East Yorkshire; and Conservative Club, S.W.*
- 1868 Whitby, Rev. Thomas, M.A., &c. *Christ Church-vicarage, Plymouth.*
- 1857 White, Arthur D., Esq., M.D. 56, *Chancery-lane, W.C.*
- 1879 White, Augustus, Esq. "*Whiteville,*" *Fortis-green, Finchley, N.*
- 1873 White, Francis W., Esq. *Hankow, China. Care of H. C. Batchelor, Esq., 110, Cannon-street, E.C.*
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- 1857 White, Henry, Esq., F.S.A., J.P. 96, *Queen's-gate, Hyde-park, S.W.; and The Lodge, Hillingdon-heath, near Uxbridge.*
- 1862 White, Jas. Thos., Esq. 4, *Clarendon-place, Hyde-park, S.W.*
- 1874 White, Owen, W., Esq. *Piersfield, South Streatham.*
- 1879 White, Robert, Esq. "*Whiteville,*" *Fortis-green, Finchley, N.; and Mildmay-chambers, 82, Bishopsgate-street, E.C.*
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- 1866 White, W. A., Esq., C.B., H.M. Minister, *Bucharest. Care of G. C. Rowland, Esq., Librarian's Dept., Foreign-office, S.W.*
- 1863 White,\* Wm. O., Esq. 10, *Lime-st., E.C.; and Barnsfield, near Dartford, Kent.*
- 1873 Whitehead,\* Chas., Esq., F.S.A. *Barning-house, Maidstone.*
- 1874 Whitehead, Colonel F. George. 14, *New Cavendish-street, W.*
- 1873 Whitford, John, Esq. 21, *Alfred-street, Liverpool.*

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- 1874 Whitmee, Rev. S. J. 17, *Leinster-square, Rathmines, Dublin.*
- 1878 Whittingham, W. B., Esq. *North View, The Drive, Walthamstow; and 91, Gracechurch-street, E.C.*
- 1865 Whympier, Edward, Esq. *Town-house, Haslemere.*
- 1875 Whyte, Jas., Esq.
- 1869 Whytt, Ebenezer, Esq. *The Grove, Highgate, N.*
- 1873 Whytt, P. Falconer, Esq. *The Grove, Highgate, N.*
- 1878 Wickenden,\* Geo. Thos., Esq., F.Z.S. 9, *Cornwall-residences, York-gate, N.W.; and Hanover-square Club, W.*
- 1871 Wiggins,\* Joseph, Esq. 4, *The Elms, Sunderland.*
- 1878 Wild, Dr. John James. 21, *Hayter-road, Brixton, S.W.*
- 1870 Wilder, Frederick, Esq. *Purley-hall, Reading.*
- 1867 Wilkins, J. E., Esq. 4, *Paper-buildings, Inner Temple, E.C.*
- 1860 Wilkinson,\* Major A. Eastfield, R.A. *Oudh Commission, India; 7, Cavendish-place, Brighton; and Army and Navy Club, S.W.*
- 1879 Wilkinson, Edw., Esq. 10 *New-square, Lincoln's-inn, W.C.*
- 1865 Wilkinson, Dr. G. 4, *St. John's-wood-villas, St. John's-wood, N.W.*
- 1875 p. Wilkinson, Capt. J. Fenwick. 2, *Wilton-villas, Codrington-road, Ramsgate.*
- 1865 Wilkinson, J. J., Esq. 3, *Victoria-street, Westminster, S.W.*
- 1879 Wilkinson, John Sheldon, Esq. 4, *St. James's-place, S.W.*
- 1874 Wilkinson, Joseph, Esq. *York.*
- 1878 Wilkinson, Col. Josiah. *Highgate, N.*
- 1879 Wilks, Ezra Tompkins, Esq. *Mayfield-road, Dalston; and 6, Coal-exchange, E.C.*
- 1872 Willans,\* John Anderson, Esq. 6, *Vincent-square, Westminster, S.W.*
- 1878 Willans, William Henry, Esq. 23, *Holland-park, W.*
- 1857 Willcock, J. W., Esq., Q.C. *Woodside-house, New-haw, Weybridge, Surrey.*
- 1879 Williams, Charles, Esq. 22, *Bedford-street, Covent-garden, W.C.*
- 1876 Williams, Conyngham O., Esq. *New Leeds-college, Leeds.*
- 1880 Williams, David, Esq. *Pateley-bridge, near Leeds, Yorkshire.*
- 1863 Williams, Frederick G. A., Esq. *Chapel-stairs, Lincoln's-inn, W.C.*
- 1856 Williams, Henry Jones, Esq. 12, *Hereford-gardens, Park-lane, W.; and 82, King William-street, E.C.*
- 1856 Williams, Henry R., Esq. 183, *Camden-road, N.W.*
- 1876 Williams, John, Esq.
- 1873 Williams, John Robert, Esq. *Junior Carlton Club; and Fir-grove, Bromborough, Cheshire.*
- 1868 Williams,\* Michael, Esq. *Tregullow, Scorrier, Cornwall.*
- 1875 Williams,\* Montague, Esq. *Woolland, Blandford, Dorset.*
- 1878 Williams, Sparks H., Esq., F.S.A. 8, *Holland-road, Kensington, W.*
- 1874 Williams, Rev. Watkin Herbert. *Vicar of Bodelugddan, nr. St. Asaph, N. Wales.*
- 1857 Williams, Major-General Sir Wm. F., Bart., G.C.B., D.C.L. *Army and Navy Club, S.W.*
- 1867 Williams, W. Rhys, Esq., M.D. *Royal Bethlehem Hospital, S.E.*
- 1878 Willis, Chas. E., Esq. 14, *John-street, Mayfair, W.*

Year of Election.		
1873		Willis,* Major-General G. H. S., C.B. <i>United Service Club, Pall-mall, S.W.</i>
1859		Willoughby, Henry W., Esq. 32, <i>Montagu-square, W.</i>
1870		Wills, Peter Turner. 2, <i>Little Love-lane, Wood-street, E.C.</i>
1867		Wills, William Henry, Esq., M.P., J.P. <i>Frognaal-rise, Hampstead, N.W.; and Hawthornden, Clifton Down, Bristol.</i>
1876		Wilmot, Alex. Esq., J.P. <i>Port Elizabeth, Algoa Bay, S. A. Care of R. White, Esq., Mildmay-chambers, 82, Bishopsgate-street-within, E.C.</i>
1868		Wilson, Alexander, Esq. <i>Gatewick-house, Beckenham.</i>
1875		Wilson,* Capt. Chas. P. <i>Marine Department, Board of Trade, St. Katharine's Dock-house, Tower-hill, E.</i>
1880		Wilson, Rev. Charles Thomas. <i>Pavenham, Bedford.</i>
1869	C. p.	Wilson, Lieut.-Col. Charles William, C.B., R.E. 5, <i>Lansdowne-terrace, Rodwell, Weymouth.</i>
1875		Wilson, Edw. D. J., Esq., M.A., &c. <i>Airlie-house, Camberwell-grove, S.E.</i>
1875	p.	Wilson,* Dr. John Smith. 3, <i>Woodberry-villas, Seven Sisters'-road, St. Ann's-road, Stamford-hill.</i>
1877		Wilson, Major-General J. 14, <i>St. James's-square, S.W.</i>
1872		Wilson, Robert B. W., Esq.
1862		Wilson,* Robert Dobie, Esq. 15, <i>Green-street, Grosvenor-square, W.</i>
1869		Wilson, Samuel King, Esq. 3, <i>Portland-terrace, Regent's-park, N.W.</i>
1879		Wilson,* Sir Samuel. <i>Melbourne.</i>
1854		Wilson,* Admiral Thomas. 4, <i>Royal York-crescent, Clifton, Bristol.</i>
1872		Wilson, William Thomas, Esq. <i>Deutz, near Cologne.</i>
1866		Wiltshire, Rev. Thomas, M.A., F.G.S., F.L.S. 25, <i>Granville-park, Lewisham, S.E.</i>
1868		Winch,* W. Richard, Esq. <i>North Mymms-park, Hatfield.</i>
1870		Winchester, C. A., Esq. <i>Oriental Club, W.</i>
1875		Winchester, The Most Hon. the Marquis of. 1E, <i>Albany, W.; and Amport St. Mary's, Andover.</i>
1873		Windram, James, Esq.
1863		Wingate, J. F., Esq. 18, <i>Albion-street, Hyde-park-square, W.</i>
1876		Winser, Thomas Boorman, Esq. <i>Shooter's-hill-road, Blackheath, S.E.</i>
1870		Wiseman, Captain Sir Wm., Bart., R.N. <i>Care of Messrs. Case and Loudensack, 1, James-street, Adelphi, W.C.</i>
1874		Wodehouse, H. E., Esq. <i>Ham-hill, Worcester.</i>
1864		Wodehouse, J. H., Esq. (H.M.'s Commissioner and Consul-General for the <i>Sandwich Islands</i> ).
1870		Wodehouse, His Excellency Sir Philip, K.C.B. ( <i>Governor of Bombay</i> ). <i>Queen Anne's-mansions, S.W.</i>
1866		Wolff,* Sir Henry Drummond, G.C.M.G., M.P. <i>Athenæum Club, W.</i>
1880		Wolseley, Lieut.-General Sir Garnet J., G.C.M.G., K.C.B. <i>Athenæum Club, S.W.</i>
1873		Wonnacott, Jno., Esq., F.G.S. &c. <i>Wadham-house, Liskeard.</i>
1872		Wood, Captain Alexander (Bombay Staff Corps). <i>Heath-lodge, Abbey-wood, Kent; and 14, St. James's-square, S.W.</i>
1873		Wood, Chas. Malcolm, Esq. <i>Heath-lodge, Abbey-wood, Kent; and Junior Athenæum Club, S.W.</i>

Year of Election	
1873	Wood, Gilbert, Esq. <i>Percy-villa, Warren-road, Beesley-heath, Kent.</i>
1863	Wood, Henry, Esq. 10, <i>Cleveland-square, Hyde-park, W.</i>
1868	Wood,* Richard Henry, Esq., F.S.A. <i>Penrhos-house, Rugby; and Conservative Club, S.W.</i>
1874	Wood, Walter, Esq. 3, <i>Clarence-road, Finsbury-park, N.</i>
1876	Wood,* Robert Ballard, Esq. <i>Woodlands, Hampstead.</i>
1857	Woodhead, Major H. J. Plumridge. 44, <i>Charing-cross, S.W.</i>
1867	Woodfield, Mathew, Esq., M.I.C.E. <i>General Colonial Manager, Cape Copper Mining Co., Namaqualand, Cape of Good Hope. 43, Ladbroke-grove-road, Notting-hill, W.</i>
1873	Woodroffe,* John W. Allen, Esq. 90, <i>Cornwall-gardens, Queen's-gate, S.W.</i>
1876	Woods, Henry, Esq. <i>Warnford-park, Bishop's Waltham.</i>
1862	Woods, Samuel, Esq. <i>Mickleham, near Dorking, Surrey.</i>
1875	Woods, Rev. W. J., B.A. <i>Leamington.</i>
1864	Woolcott, George, Esq. 78, <i>Palace-gardens-terrace, Kensington, W.</i>
1863	Worms,* Baron George de. 17, <i>Park-crescent, Portland-place, W.</i>
1856	Worthington, J. Hall, Esq. <i>Alton-hill, Oxtou, near Birkenhead.</i>
1866	Worthington,* Richard, Esq. 7, <i>Champion-park, Denmark-hill, S.E.</i>
1875	Wragge, Clement L., Esq. <i>Farley-cottage, near Cheadle, Staffordshire.</i>
1875	Wray,* Geo., Esq., F.Z.S. 36, <i>Chester-terrace, Regent's-park, N.W.</i>
1876	Wright, Bryce M., Esq. 54, <i>Guilford-street, Russell-square, W.C.</i>
1879	Wyatt, Rev. Paul Williams. <i>Harper-place, Beaford; and St. Mary's, Colchester.</i>
1839	Wyld,* James, Esq. <i>Charing-cross, W.C.</i>
1863	Wylde, W. H., Esq. <i>Foreign-office, S.W.</i>
1879	Wyllie, Francis R. S., Esq. 3, <i>Queensborough-terrace, Hyde-park, W.; and 14, St. James's-square, S.W.</i>
1875	Wynne, Rev. Edward, M.A. <i>Parkgate-vicarage, Rotherham.</i>
1877	Wynne, John Lloyd, Esq. 7, <i>Eaton-place, S.W.</i>
1875	Wyon,* Alfred B., Esq. 2, <i>Langham-chambers, Portland-place, W.</i>
1875	Wyon, Allan, Esq. 2, <i>Langham-chambers, Portland-place, W.</i>
1879	Wyse, Lieut. Lucien N. B. (French Navy). 117, <i>Boulevard Malesherbes, Paris.</i>
1879	Yarrow, T. A. Esq. <i>Cleveland-house-school, Weymouth.</i>
1875	Yates, H. Geo., Esq. <i>Highwood, Hampstead-lane, Highgate.</i>
1861	York, Most Rev. William Thomson, Archbishop of, F.R.S. <i>Bishopsthorpe, York.</i>
1859	Yorke, Lieut.-General Sir Charles, G.C.B. 19, <i>South-st., Grosvenor-square, W.</i>

Year of  
Election.

1877		Yorke, Henry Francis Redhead, Esq. 103, <i>Eaton-place, S.W.</i>
1875		Youle,* Frederick, Esq. 4, <i>Montagu-street, Russell-square, W.C.</i>
1857	p.	Young,* Sir Allen, Knt. 5, <i>St. James's-street, S.W.</i>
1838		Young,* Charles Baring, Esq. 12, <i>Hyde-park-terrace, W.</i>
1874		Young,* Charles Edward Baring, Esq. 12, <i>Hyde-park-terrace, W.</i>
1830		Young,* James, Esq.
1858		Young, James, LL.D., F.R.S. <i>Kelly, Wemyss Bay, by Greenock.</i>
1876		Young,* Jesse, Esq., F.R.A.S. <i>Chesterton-hall, Cambridge.</i>
1857	G. C. p.	Yule, Colonel Henry, C.B. (Bengal Engineers). 3, <i>Pen-y-wern-road, Earl's-court, S.W.</i>

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# NAMES OF INDIVIDUALS

TO WHOM

## THE ROYAL PREMIUMS AND OTHER TESTIMONIALS HAVE BEEN AWARDED.

- 
- 1832.—**Mr. Richard Lander**—Royal Medal—for the discovery of the course of the River Niger or Quorra, and its outlet in the Gulf of Benin.
- 1833.—**Mr. John Biscoe**—Royal Medal—for the discovery of the land now named “Enderby Land” and “Graham Land,” in the Antarctic Ocean.
- 1834.—**Captain Sir John Ross**, R.N.—Royal Medal—for discovery in the Arctic Regions of America.
- 1835.—**Sir Alexander Burnes**—Royal Medal—for the navigation of the River Indus, and a journey by Balkh and Bokhara across Central Asia.
- 1836.—**Captain Sir George Back**, R.N.—Royal Medal—for the discovery of the Great Fish River, and its navigation to the sea on the Arctic Coast of America.
- 1837.—**Captain Robert FitzRoy**, R.N.—Royal Medal—for the survey of the Shores of Patagonia, Chile, and Peru.
- 1838.—**Colonel Chesney**, R.A.—Royal Medal—for the general conduct of the “Euphrates Expedition” in 1835-6, and for accessions to the geography of Syria, Mesopotamia, and the Delta of Susiana.
- 1839.—**Mr. Thomas Simpson**—Founder's Medal—for the discovery and tracing, in 1837 and 1838, of about 300 miles of the Arctic shores of America.
- Dr. Edward Rüppell**—Patron's Medal—for his travels and researches in Nubia, Kordofán, Arabia, and Abyssinia.
- 1840.—**Col. H. C. Rawlinson**, E.I.C.—Founder's Medal—for his travels and researches in Susiana and Persian Kurdistan, and for the light thrown by him on the comparative geography of Western Asia.
- Sir R. H. Schomburgk**—Patron's Medal—for his travels and researches during the years 1835-9 in the colony of British Guayana, and in the adjacent parts of South America.
- 1841.—**Lieut. Raper**, R.N.—Founder's Medal—for the publication of his work on ‘Navigation and Nautical Astronomy.’
- Lieut. John Wood**, I.N.—Patron's Medal—for his survey of the Indus, and re-discovery of the source of the River Oxus.
- 1842.—**Captain Sir James Clark Ross**, R.N.—Founder's Medal—for his discoveries in the Antarctic Ocean.
- Rev. Dr. E. Robinson**, of New York—Patron's Medal—for his work entitled ‘Biblical Researches in Palestine.’
- 1843.—**Mr. Edward John Eyre**—Founder's Medal—for his explorations in Australia.
- Lieut. J. F. A. Symonds**, R.E.—Patron's Medal—for his survey in Palestine, and levels across the country to the Dead Sea.

- 1844.—**Mr. W. J. Hamilton**—Founder's Medal—for his researches in Asia Minor.  
**Prof. Adolph Erman**—Patron's Medal—for his extensive geographical labours.
- 1845.—**Dr. Beke**—Founder's Medal—for his extensive explorations in Abyssinia.  
**M. Charles Ritter**—Patron's Medal—for his important geographical works.
- 1846.—**Count P. E. de Strzelecki**—Founder's Medal—for his explorations and discoveries in the South-Eastern portion of Australia, and in Van Diemen's Land.  
**Prof. A. Th. Middendorff**—Patron's Medal—for his extensive explorations and discoveries in Northern and Eastern Siberia.
- 1847.—**Capt. Charles Sturt**—Founder's Medal—for his various and extensive explorations in Australia.  
**Dr. Ludwig Leichhardt**—Patron's Medal—for a journey performed from Moreton Bay to Port Essington.
- 1848.—**Sir James Brooke**, Rajah of Sarawak and Governor of Labuan—Founder's Medal—for his expedition to Borneo.  
**Captain Charles Wilkes**, U.S.N.—Patron's Medal—for his Voyage of Discovery in the S. Hemisphere and in the Antarctic Regions, in the years 1838-42.
- 1849.—**Austen H. Layard**, Esq., D.C.L. M.P.—Founder's Medal—for his contributions to Asiatic geography, researches in Mesopotamia, and discoveries of the remains of Nineveh.  
**Baron Ch. Hügel**—Patron's Medal—for his explorations of Cashmere and surrounding countries, communicated in his work entitled 'Kashmir und das Reich der Siek.'
- 1850.—**Col. John Ch. Frémont**—Patron's Medal—for his successful explorations of the Rocky Mountains and California; and for his numerous Discoveries and Astronomical Observations.  
The Rev. DAVID LIVINGSTONE, of Kolobeng—a Chronometer Watch—for his successful explorations of South Africa.
- 1851.—**Dr. GEORGE WALLIN**, of Finland—25 Guineas—for his Travels in Arabia.  
**Mr. THOMAS BRUNNER**—25 Guineas—for his explorations in the Middle Island of New Zealand.
- 1852.—**Dr. John Rae**—Founder's Medal—for his survey of Boothia and of the Coasts of Wollaston and Victoria Lands.  
**Captain Henry Strachey**—Patron's Medal—for his Surveys in Western Tibet.
- 1853.—**Mr. Francis Galton**—Founder's Medal—for his explorations in Southern Africa.  
**Commander E. A. Inglefield**, R.N.—Patron's Medal—for his Survey of the Coasts of Baffin Bay, Smith and Lancaster Sounds.
- 1854.—**Rear-Admiral William Henry Smyth**—Founder's Medal—for his valuable Surveys in the Mediterranean.  
**Captain Robert J. M. M'Clure**, R.N.—Patron's Medal—for his discovery of the North-West Passage.
- 1855.—**The Rev. David Livingstone**, M.D., &c.—Patron's Medal—for his Scientific Explorations in Central Africa.  
**Mr. CHARLES J. ANDERSSON**—a Set of Surveying Instruments—for his Travels in South-Western Africa.

- 1856.—**Elisha Kent Kane, M.D.**—Founder's Medal—for his discoveries in the Polar Regions.  
**Heinrich Barth, PHIL. DR.**—Patron's Medal—for his explorations in Central Africa.  
 Corporal J. F. CHURCH, of the Royal Engineers—a Watch and Chain—for his scientific observations while attached to the Mission in Central Africa.
- 1857.—**Mr. Augustus C. Gregory**—Founder's Medal—for his explorations in Western and Northern Australia.  
**Lieut. - Col. Andrew Scott Waugh, Bengal Engineers**—Patron's Medal—for the Great Trigonometrical Survey of India.
- 1858.—**Captain Richard Collinson, R.N.**—Founder's Medal—for his Discoveries in the Arctic Regions.
- 1858.—**Prof. Alexander Dallas Bache, Superintendent U. S. Coast Survey**—Patron's Medal—for his extensive Surveys of America.
- 1859.—**Captain Richard F. Burton**—Founder's Medal—for his Explorations in Eastern Central Africa.  
**Captain John Palliser**—Patron's Medal—for his explorations in British North America and the Rocky Mountains.  
 Mr. JOHN MACDOUALL STUART—a Gold Watch—for his Discoveries in South and Central Australia.
- 1860.—**Lady Franklin**—Founder's Medal—in commemoration of the discoveries of Sir J. Franklin.  
**Captain Sir F. Leopold McClintock, R.N.**—Patron's Medal—for his Discoveries in the Arctic Regions.
- 1861.—**Captain John Hanning Speke**—Founder's Medal—for the Discovery of the Great Lake Victoria Nyanza, Eastern Africa, &c.  
**Mr. John Macdouall Stuart**—Patron's Medal—for his Explorations in the Interior of Australia.
- 1862.—**Mr. Robert O'Hara Burke**—Founder's Medal—for his Explorations in Australia.  
**Captain Thomas Blakiston**—Patron's Medal—for his survey of the River Yang-tsze-kiang.  
 Mr. JOHN KING—a Gold Watch—for his meritorious conduct while attached to the Expedition under Mr. R. O'Hara Burke.
- 1863.—**Mr. Frank T. Gregory**—Founder's Medal—for his explorations in Western Australia.  
**Mr. John Arrowsmith**—Patron's Medal—for the very important services he has rendered to Geographical Science.  
 Mr. WILLIAM LANDESBOROUGH—a Gold Watch—for successful Explorations in Australia.  
 Mr. JOHN M'KINLAY—a Gold Watch—for successful Explorations in Australia.  
 Mr. FREDERICK WALKER—a Gold Watch—for successful Explorations in Australia.
- 1864.—**Captain J. A. Grant**—Patron's Medal—for his journey from Zanzibar across Eastern Equatorial Africa to Egypt, in company with Captain Speke.  
**Baron C. von der Decken**—Founder's Medal—for his two Geographical Surveys of the lofty Mountains of Kilima-njaro.  
 Rev. W. GIFFORD PALGRAVE—the sum of 25 Guineas—for the purchase of a Chronometer or other Testimonial, for his adventurous Journey in and across Arabia.
- 1865.—**Captain T. G. Montgomerie, R.E.**—Founder's Medal—for his Trigonometrical Survey of North-West India.

**Mr. S. W. Baker**—Patron's Medal—for his relief of Capts. Speke and Grant, and his endeavour to complete the discoveries of those travellers.

Dr. A. VÁMBÉRY—the sum of 40 Pounds—for his Travels in Central Asia.

1866.—**Dr. Thomas Thomson, M.D.**—Founder's Medal—for his Researches in the Western Himalayas and Thibet.

**Mr. W. Chandless**—Patron's Medal—for his Survey of the River Purús.

M. P. B. DU CHAILLU—the sum of 100 Guineas—for his Astronomical Observations in the Interior of Western Equatorial Africa.

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1867.—**Admiral Alexis Boutakoff**—Founder's Medal—for being the first to launch and navigate ships in the Sea of Aral.

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1868.—**Dr. Augustus Petermann**—Founder's Medal—for his zealous and enlightened services as a writer and cartographer in advancing Geographical Science.

**Mr. Gerhard Rohlfs**—Patron's Medal—for his extensive and important travels in the interior of Northern Africa.

The PUNDIT employed by Captain T. G. Montgomerie—a Gold Watch—for his route survey from Lake Mansarowar to Lhasa, in Great Thibet.

#### EDUCATIONAL PRIZE :—

Mr. JOHN WILSON—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1869.—**Professor A. E. Nordenskiöld**—Founder's Medal—for the leading part he took in the recent Swedish Expeditions in the North Polar Region.

**Mrs. Mary Somerville**—Patron's Medal—in recognition of the able works published by her, which have largely benefited Geographical Science.

#### SCHOOLS' PRIZE MEDALS :—

*Political Geography.*—HY. G. RICHMOND, Liverpool College (Gold Medal).

JAS. DEARDEN WILDE, Manchester Grammar School (Bronze Medal).

*Physical Geography.*—WM. GRUNDY, Rossall School (Gold Medal).

GEO. WM. GENT, Rossall School (Bronze Medal).

#### EDUCATIONAL PRIZE :—

Mr. JOHN KIDNEY—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1870.—**Lieutenant Fras. Garnier** (of the French Imperial Navy)—Patron's Medal—for his survey of the course of the great Cambodian River during the years 1866-8.

**Mr. George W. Hayward**—Founder's Medal—For his explorations in Eastern Turkistan.

#### SCHOOLS' PRIZE MEDALS :—

*Political Geography.*—GEO. WM. GENT, Rossall School (Gold Medal).

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#### EDUCATIONAL PRIZE :—

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**A. Keith Johnston**, LL.D.—Patron's Medal—for his long-continued and successful services in advancing Geography, and especially for his merit in carrying out his scheme of Physical Atlases.

**SCHOOLS' PRIZE MEDALS:—**

*Political Geography*.—**GEO. HOGGEN**, University School, Nottingham (Gold Medal).

**RICHD. NAYLOR ARKLE**, Liverpool College (Bronze Medal).

*Physical Geography*.—**DANIEL MCALISTER**, Liverpool Institute (Gold Medal).

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**EDUCATIONAL PRIZE:—**

**Mr. JOHN ARMSTRONG**—the sum of Five Pounds—for successful competition in Geography at the Society of Arts examination.

1872.—**Colonel Henry Yule**, C.B.—Founder's Medal—for the eminent services he has rendered to Geography in the publication of his three great works, 'A Mission to the Court of Ava,' 'Cathay, and the Way Thither,' and 'Marco Polo.'

**Mr. Robert Berkeley Shaw**—Patron's Medal—for his Journeys in Eastern Turkistan, and for his extensive series of Astronomical and Hypsometrical Observations, which have enabled us to fix the longitude of Yarkand, and have given us, for the first time, the basis of a new delineation of the countries between Leh and Kashgar.

**Lieut. G. C. MUSTERS, R.N.**—a Gold Watch—for his adventurous Journey in Patagonia, through 960 miles of latitude, of which 780 were previously unknown to Europeans.

**KARL MAUCH**—the sum of Twenty-five Pounds in acknowledgment of the zeal and ability with which he has devoted himself, for a series of years, to the Exploration of South-Eastern Africa.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography*.—**S. E. SPRING RICE**, Eton College (Gold Medal).

**A. S. BUTLER**, Liverpool College (Bronze Medal).

*Political Geography*.—**W. G. COLLINGWOOD**, Liverpool College (Gold Medal).

**W. C. GRAHAM**, Eton College (Bronze Medal).

**EDUCATIONAL PRIZE:—**

**Mr. GEO. M. THOMAS**—the sum of Five Pounds—for successful competition in Geography at the Society of Arts Examination.

1873.—**Mr. Ney Elias**—Founder's Medal—for his survey of the Yellow River of China, in 1868; and for his recent journey through Western Mongolia.

**Mr. H. M. Stanley**—Patron's Medal—for his discovery and relief of Dr. Livingstone.

**Mr. THOMAS BAINES**—a Gold Watch—for his long-continued services to Geography, and especially for his journeys in South-Western and South-Eastern Africa.

**Captain CARLSEN**—a Gold Watch—for his discoveries in the Arctic Seas, and for having circumnavigated the Spitzbergen as well as the Nova Zembla groups.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography*.—**W. C. HUDSON**, Liverpool College (Gold Medal).

**W. A. FORBES**, Winchester College (Bronze Medal).

*Political Geography*.—**S. E. SPRING RICE**, Eton College (Gold Medal).

**A. T. NUTT**, University College School (Bronze Medal).

1874.—**Dr. Georg Schweinfurth**—Founder's Medal—for his discovery of the Uelle River, beyond the South-western limits of the Nile basin; and for his admirable work, 'The Heart of Africa,' in which he has recorded the results of his travels.

**Colonel P. Egerton Warburton**—Patron's Medal—for his journey across the previously unknown Western Interior of Australia; from Alice Springs, on the line of overland telegraph, to the West Coast near De Grey River.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—LOUIS WESTON, City of London School (Gold Medal).

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*Political Geography.*—WILLIAM HARRY TURTON, Clifton College, Bristol (Gold Medal).

LIONEL JACOB, City of London School (Bronze Medal).

1875.—**Lieut. Weyprecht**—Founder's Medal—for his explorations and discoveries in the Arctic Sea between Spitzbergen and Nova Zembla.

**Lieut. Julius Payer**—Patron's Medal—for his journey and discoveries along the coast of Franz-Josef's Land, between Spitzbergen and Nova Zembla.

W. H. JOHNSON—Gold Watch—for services rendered to Geography while engaged in the Great Trigonometrical Survey of India among the Himalayas.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—HENRY ALEXANDER MIERS, Eton College (Gold Medal).

ARCHIBALD EDWARD GARROD, Marlborough College (Bronze Medal).

*Political Geography.*—SIDNEY H. B. SAUNDERS, Dulwich College (Gold Medal).

WM. C. GRAHAM, Eton College (Bronze Medal).

1876.—**Lieut. V. Lovett Cameron, R.N.**—Founder's Medal—for his journey across Africa from Zanzibar to Benguela, and his survey of the Southern half of Lake Tanganyika.

**Mr. John Forrest**—Patron's Medal—in recognition of the services to Geographical Science rendered by his numerous successful explorations and route-surveys in Western Australia.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—JOHN WILKIE, Liverpool College (Gold Medal).

WALTER NEW, Dulwich College (Bronze Medal).

*Political Geography.*—THOMAS KNOX, Haileybury College (Gold Medal).

W. M. H. MILNER, Marlborough College (Bronze Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDAL:—**

F. H. GLANVILL, Devon County School (Silver Medal).

**OXFORD LOCAL EXAMINATIONS PRIZE MEDALS:—**

JOHN WILKIE, Liverpool College (Silver Medal).

H. M. WARD, Bridgnorth Grammar School (Bronze Medal).

1877.—**Captain Sir George S. Nares, R.N., K.C.B.**—Founder's Medal—for having commanded the Arctic Expedition of 1875-6; also for his Geographical services in command of the *Challenger* Expedition.

**The Pundit Nain Singh**—Patron's Medal—for his great journeys and surveys in Tibet and along the Upper Brahmaputra, during which he determined the position of Lhása, and added largely to our positive knowledge of the Map of Asia.

Captain A. H. MARKHAM, R.N.—a Gold Watch—for having commanded the Northern Division of sledges in the Arctic Expedition of 1875-6, and for having planted the Union Jack in  $83^{\circ} 20' 26''$  N., a higher latitude than had been reached by any previous Expedition.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—WALTER NEW, Dulwich College (Gold Medal).

ARTHUR SMYTH FLOWER, Winchester College (Bronze Medal).

*Political Geography.*—WILLIAM JOHN NEWTON, Liverpool College (Gold Medal).

JOHN WILKIE, Liverpool College (Bronze Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDALS:—**

H. C. TEMPLE, Brighton Grammar School (Silver Medal for Physical Geography, and Silver Medal for Political Geography).

**OXFORD LOCAL EXAMINATIONS PRIZE MEDALS:—**

JOHN EDWARD LLOYD, Chatham Institute, Liverpool (Silver Medal).

JAMES EDWIN FORTY, City Middle-Class School (Bronze Medal).

**1878.—Baron F. von Richthofen**—Founder's Medal—for his extensive travels and scientific explorations in China; also for his great work in which the materials accumulated during his long journeys are elaborated with remarkable lucidity and completeness.

**Captain Henry Trotter, R.E.**—Patron's Medal—for his services to Geography, in having conducted the Survey operations of the late Mission to Eastern Turkistan, under Sir Douglas Forsyth, which resulted in the connection of the Trigonometrical Survey of India with Russian Surveys from Siberia; and for having further greatly improved the map of Central Asia.

**SCHOOLS' PRIZE MEDALS:—**

*Physical Geography.*—WILLIAM JOHN NEWTON, Liverpool College (Gold Medal).

CHRISTOPHER MOUNSEY WILSON, Clifton College (Silver Medal).

*Political Geography.*—WILLIAM WALLACE ORD, Dulwich College (Gold Medal).

GEORGE ARNOLD TOMKINSON, Haileybury College (Silver Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDALS:—**

P. W. EVANS, Cardiff (Silver Medal for Physical Geography).

J. HAYNES, West Buckland (Silver Medal for Political Geography).

**OXFORD LOCAL EXAMINATIONS PRIZE MEDALS:—**

ARTHUR EDWIN RESTARICK, North London College School (Silver Medal).

FREDERICK WILLIAM KELLETT, Kingswood and Woodhouse Grove School (Bronze Medal).

**1879.—Colonel N. Prejevalsky**—Patron's Medal—for his successive Expeditions, route-surveys, in the years 1870-3 to Mongolia and the high plateau of Northern Tibet—unexplored country; also for his journey from Kulja to Lob-Nor in 1876-7, and for his published narratives of his travels.

**Captain W. J. Gill, R.E.**—Founder's Medal—for the important Geographical work along the northern frontier of Persia in 1873, and in Western China and Tibet in 1877; and especially for the traverse-survey made by him during the latter journey, and the very complete maps of his route.

**SCHOOLS' PRIZE MEDALS :—**

*Physical Geography.*—MATTHEW GEORGE GRANT, Liverpool College (Gold Medal).

FRANK TAYLOR SHARPE, Liverpool College (Silver Medal).

*Political Geography.*—DAVID BOWIE, Dulwich College (Gold Medal).

CLAUDE L. BICKNELL, Harrow School (Silver Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDALS :—**

J. R. DAVIS (Silver Medal for Physical Geography).

MISS HELEN JONES (Silver Medal for Political Geography).

**OXFORD LOCAL EXAMINATIONS PRIZE MEDALS :—**

ALLAN DANSON RIGBY, Liverpool College (Silver Medal).

ERNEST EDWARD KELLETT, Kingswood School, Bath (Bronze Medal).

1880.—**Lieut. A. Louis Palander**—Founder's Medal—for his services in connection with the Swedish Arctic Expedition, under Prof. A. E. Nordenskiöld, in the *Vega* in 1878–9.

**Ernest Giles**—Patron's Medal—for his explorations and surveys in Australia in 1872–6.

**Bishop Crowther**—Gold Watch—in recognition of his services to Geography on the River Niger.

**E. H. Bunbury**—Vote of Thanks by the Council in acknowledgment of the value of his 'History of Ancient Geography.'

**SCHOOLS' PRIZE MEDALS :—**

*Physical Geography.*—DAVID BOWIE, Dulwich College (Gold Medal).

ALBERT LEWIS HUMPHRIES, Liverpool College (Silver Medal).

*Political Geography.*—FREDERICK JAMES NAYLOR, Dulwich College (Gold Medal).

THEODORE BROOKS, London International College (Silver Medal).

**CAMBRIDGE LOCAL EXAMINATIONS PRIZE MEDALS :—**

MISS A. S. WESTBURY (Silver Medal for Physical Geography).

W. HORNBY (Silver Medal for Political Geography).









JOURNAL  
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I.—*Itineraries of the Second Khedivial Expedition: Memoir explaining the New Map of Midian made by the Egyptian Staff-officers.* By RICHARD F. BURTON.

[WITH MAP.\*]

"Tanta ad pericula et impendia satis fuit causa sperare quod cuperent."—  
PLINY, 'Nat. Hist.' xxxiii. 21.

PART I.

*The Return to North Midian, and Cruise in the Gulf El' Akabah.*

*Introductory Remarks.*—In the following pages I offer to the Royal Geographical Society the Route-book and Itineraries of the Expedition of 1877-78, in its threefold division, which formed our second journey to Midian; and here it is proposed to dwell especially upon the lines of road; the positions, the geography of the country; and, briefly, upon all that constitutes pure topography. Thus the present Journals will serve as letter-press to the map drawn up from the flying surveys of the three Egyptian Staff-officers who were detailed by the Khediv of Egypt to lay down the limits of His Highness's easternmost provinces. The papers, therefore, will in no wise assume the character of a popular volume.

A popular account of the First Khedivial Expedition has already appeared in 'The Gold Mines of Midian,' &c. (London: C. Kegan Paul and Co., 1878). The ethnological information, such as descriptions of the tribes collected by the second, has been reserved for future publication; the notes upon the little collection of antiquities and human crania have been

\* From 'The Land of Midian (Revisited),' C. Kegan Paul and Co., 1879.

forwarded to the Anthropological Institute; and the coins of Midian to the Royal Asiatic Society. 'The Land of Midian (Revisited),' my last two volumes (London: C. Kegan Paul & Co., 1879), contain a *relation historique*, a general account of our last journey, without, however, entering into scientific notices or topographical details.

And, first, a few observations upon the country which has, I may say, been explored by the two Khedivial Expeditions of 1877 and of 1877-78.

The Land of Midian is by no means one of the now numerous "geographical expressions." The present tenants of the soil give a precise and practical definition of its limits. Their "Arz Madyan" (ارض مدين) extends from El-'Akabah north

(Raper: N. lat.  $29^{\circ} 28'$ ) to El-Muwaylah, with its Wady, El-Surr (N. lat.  $27^{\circ} 40'$ ), a total latitudinal length of 108 direct geographical miles.\* South of this line, the seaboard of north-western Arabia, as far as El-Hijáz, has no generic name. The Bedawin are contented with such vague terms, derived from some striking feature, as "The Lands of Zibá," of "Wady Salmá," of "Wady Damah," of "El-Wijh,"—to denote the tract lying between the parallels of El-Muwaylah and of Wady Hamz (حمض) in N. lat.  $25^{\circ} 55' 5''$ . Thus the north-south length of the southern moiety would be 105 direct geographical miles, or a little less than the northern; and the grand total would be 213 miles.

The breadth of this easternmost province of Egypt is the distance from the sea to the maritime mountains. In "Madyan" (proper), the extremes would be 24 and 35 miles. For the southern half these distances may be doubled. The Bedawin are here again definitive in their limits: all the "Tihámah," or lowlands and their ranges, belong to Egypt; east of it, the Daulat Shám, the "Government of Syria" claims possession.

I have taken the liberty of calling the whole tract Midian: the land above El-Muwaylah (Madyan proper) I would term "North Midian," and that below it "South Midian." In the days of the ancient Midianites the frontiers were so elastic that at times, but only temporarily, they embraced Sinai, and were pushed forward even into Central Palestine. Moreover,

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\* Let me protest at once against the assertion contained in an able review of "The Gold Mines" ("Pall-Mall Gazette," June 7, 1878). The writer makes ancient Midian "extend from the north of the Arabic Gulf (El-'Akabah(?)) and Arabia Felix (which? of the classics or of the moderns?) to the plains of Moab"—exactly where, if it ever did, it assuredly does not now extend.

I would prolong the limits eastward as far as the Damascus-Medīnah road of Sultan Sulayman the Magnificent. This would be politically and ethnologically correct. With the exception of the Ma'ázah country, the whole region belongs to Egypt; and all the tribes, formerly Nabathæan and now more or less Egypto-Arab, never question the rights of His Highness the Viceroy, who garrisons the seaboard forts. Of the other points, historical and geographical, I am not so sure. My learned friend, Aloys Sprenger, remarks: "Let me observe that your extending the name 'Midian' over the whole country, as far south as the dominions of the Porte, appears to me an innovation, by which the identity of the race along the shore of the Gulf of 'Akabah, and of the coast down to Wajh and Hawrá, is prejudged. Would it not be better to leave Midian where it always has been, and to consider Badá\* the centre of Thamuditis, as it was in the time of Pliny and Ptolemy, and as it continued to be until the Balee (Baliyy), and other Qodhá'a (Kudá'a) tribes, came from Southern Arabia, and exterminated the Thamudites?"

This is, doubtless, a valid objection; its only weak point is that it goes too far back. We cannot be Conservatives in geography, nor attach much importance, in the nineteenth century, to a race, the Beni Tamúd, which had wholly disappeared before the seventh. On the whole, it still appears to me that by adopting my innovation we gain more than we lose; but the question must be left to a higher tribunal, the geographical world.

In our days two great Sultánís ("highways") bound Madyan the less and Midian the greater. The western, followed by the Hajj el-Misri (Egyptian caravan), dates from the age of Sultan Selim Khán (ob. A.D. 1520), El-Fatih, or the Conqueror, who, before making over the province to the later Mamlúk Beys, levelled the rocks, cut through ridges, laid out the track, dug wells, and defended the line by forts. Before that time the road lay, for convenience of water, to the east or inland; it was, in fact, the old Nabathæan highway which, according to Strabo, connected the southernmost port, Leukè Kóme, with the western capital, Petra. Farther east, and far beyond the double chain of maritime mountains, runs the highway followed by the Hajj el-Shámi (Syrian or Damascus caravan), which sets out from Constantinople, musters at Damascus, and represents the puissance of the Porte. According to the Akhbár el-Duwal ('Notices of Kingdoms' †) by Ahmed el-Dimishkí

\* See chap. xv. of the 'Land of Midian (Revisited);' and Part III. sect. 3 of this paper.

† Not "tidings of changes of fortunes," as interpreted in the 'Journal of the Royal Geographical Society,' vol. xx. p. 319.

(finished A.H. 1008 = A.D. 1599), the successor of Sultan Selim I., Sultan Sulyman Khan (ob. 1566) laid out this road, built the castle of Tabúk, and placed there a guard of twenty janissaries to protect the spring from the Bedawin. On both these main lines water is procurable at almost every station, and to them military expeditions are perforce limited. The parallelogram between the two, varying in breadth, according to Wallin, from 90 to 120 miles (direct and geographical), is irregularly supplied with fountains, wells and rain-pits, which can always be filled up and rendered useless by the Bedawin.

I now proceed without further preamble to our march.

I. *Departure of the Expedition.*—On Wednesday, December 19, 1877, the second Khedivial Expedition to the mines of Midian landed from His Highness's gunboat the *Mukhbir* (Capt. Mohammed Siráj), at a gap, called a port, in the reef of El-Muwaylah (N. lat.  $27^{\circ} 39'$ , and E. long.  $35^{\circ} 28'$ ). This fort and station of the Egytian Hajj ("Pilgrim caravan") was described some 31 years ago by that excellent Arabist, the late Dr. George Aug. Wallin; he travelled in 1847–48, and he published in the 'Journal' of the Royal Geographical Society, vol. xx., 1850. As will be seen, he is in error when "finding no mention made of Muweileh (El-Muwaylah) in Arabic manuscripts, nor any traces or traditions among the existing generation in the land, pointing to a high antiquity," he professes himself "inclined to consider it a town of modern origin" (loc. cit. p. 300). Equally mistaken, I believe, was the learned Vincent (Periplus, &c.), who attempts to identify it with the great naval and commercial station of Leukè Kóme, a term applicable to almost any settlement on this coralline coast. The "White Village," however, lies, as will be seen, much farther south.

Before leaving the coast I must briefly introduce the second Khedivial Expedition to the reader. The *personnel*, not including the Commander, was composed of eight Europeans: M. George Marie (engineer); Mr. Charles Clarke, Telegraph Engineer (commissariat officer); M. Lacaze (artist and photographer); Mr. David Duguid (chief engineer of the gunboat), temporarily attached to us; and Mr. Philipin (smith), with three Greeks—at least two too many:—Anton (dragoman), Giorgi (cook), and Petros (waiter). There were five Egyptian officers—Ahmed Kaptán Musallam, Commander Egyptian navy (astronomical observer); and two on the staff (*Arkán-Harb*); Lieutenant Amir, who had accompanied the first Khedivial Expedition, and Lieutenant Yusuf Taufik (mappers and surveyors); Darwaysh Effendi, Lieutenant in the Piyadah (line), commanded the escort; and sub-Lieut. Mohammed

Farahát, the Ma'adanjyah and Haggárah (sappers, miners and quarrymen).

The men were three privates of the staff, including Ali 'Brahim, a hard-working and valuable servant; and Yúsef el-Fázi, his mate, a quartermaster, lent by the gunboat; the latter was generally useful as an English sailor. The escort, under an Egyptian sergeant and four corporals, was composed mostly of emancipated negroes, with a few Súdánis collected from every tribe in the basin of the Upper Nile. These men were armed with Remingtons, except the trumpeter, who carried a navy Colt; and they numbered twenty-five, not including the pistoleer or the Buluk-amin (writer). I also engaged five Básh-Buzuks from the little garrison of El-Muwaylah, because the irregulars are familiar with the country, and friendly with the Bedawin. The sappers, miners and quarrymen, who were unarmed, amounted to thirty-three, without reckoning the sergeant, the corporal and the carpenter. Thus the total was sixty-five men, or seventy, including officers.

The Ras el-Káfilah, or commander of the caravan, was the Sayyid 'Abd el-Rahím, who escorted us during the first journey; and he generally had with him, besides my old friend, Haji Wali of Zagázig, three Bedawi Shayks; for escort and service the latter received each an honorarium of one dollar per diem. The camp-followers were few: a Sais or groom, who superintended the care of our ten mules; Ali Mullah, a Barbari, servant to Haji Wali; Husayn Genínah, a boy who waited upon Lieutenant Yusuf; and "Hamad," an itinerant coffee-vendor, who attached himself to us at El-Muwaylah. I hardly need notice the cameleers and their varlets, who were always being changed.

The transport difficulties were increased by the rivalry of the two tribes that contended for the honour and profit of fleecing us. The first were the Beni 'Ukbah, or "Sons of the Heel," who claim, after Arab fashion, the land on which the fort El-Muwaylah is built. Their Shaykh, Hasan ibn Salím el-'Ukbi, who had been honoured with an order from the Government of the Viceroy, declared himself willing to supply any number of camels at the rate of 1 dollar a-head for the four very short marches between El-Muwaylah and the Jebel el-Abyaz, my present objective. But a former employé, 'Abd el-Nabi of the Tagaygát clan of the great Huwaytát tribe, refused to march with the Beni 'Ukbah; demanded a third more pay; and, professing readiness to carry me and mine gratis, would not move under 1 dollar 25 cents. In April 1877 he had proved himself a manner of noble savage, a good man and true. But my kindness had spoilt him; and the



only remedy was to send him about his business as soon as possible.

It is usual in Arabia to engage camels by the stage, not by the day. For instance, the pilgrims pay according to tariff 1 dollar per long march of 12 hours, and the same is the hire for a dromedary post. But this would have been hardly fair to the Arabs, when we intended to make weekly and even longer halts. At last I agreed to hire each camel for 5 piastres on idle and ten on working days: the piastre being assumed at 97.20 = 1 sovereign.

II. *Itinerary from El-Muwaylah to Magháir Shuayb.*—December 20th, 1877.—The day was spent in starting a dromedary-post, in housing and ticketing our stores entrusted to a magazine-man at the Fort of El-Muwaylah, and in settling various disputes.

Dec. 21st.—The large, straggling and most disorderly caravan, carrying 20 tents and 50 large boxes, required about 80 animals, without counting a certain number of dromedaries (*Hijn*) for riding purposes. The half-loads brought up the total to 106; and the greedy drivers demanded pay for 120. It would irk the reader to recount the normal troubles of such marches. Suffice it to say that the men were as wild and unmanageable as their beasts; that the latter were half-starved; that nothing could be worse than their gear, and that the caravan for the first four days was the most disorderly mob that I have yet seen. Of course it gradually improved, and at last we could load in fifteen minutes; this day the process had wasted five hours.

The trumpet sounded the "General" at 3 A.M., and the start took place sometime about 8 A.M. We marched past the old tomb of Shaykh Abdullah by the way of the Egyptian pilgrimage along the shore. After 2 hours the road forks; I wanted to take the left, but was led to the right: despite my express orders to encamp for the night near the seashore ruins of Tiryam, we were guided to its nakhil or *palmetum*, distant 1 hour 30 minutes walk up the valley, and described during my first expedition.\* There is nothing Arabs and Egyptians will not do in order to pitch tent as near water as they safely can. The broad dusty track, laid out by camels' feet, subtended the long projection Ras Wady Tiryam (head of the Tiryam Valley), shown in the Ad. Chart: it rests upon a base of knobby hills and hillocks from 50 to 150 feet high, dirty-yellow grit of modern formation, scattered with sand and metallised with rusty ironstone, which here and there appears

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\* 'The Gold Mines of Midian,' p. 272.

in blotches. Despite the heavy rains of December 9-10, 1877, the land was utterly dried up: we saw a single troop of gazelles, a few sea-fowl, and a little long-eared hare like a *leporide*, now in the British Museum. The hardy thorns, acacias and mimosas; the juicy salsolaceæ and suædæ, *salicorniæ* (*perfoliata*), and *scelanthus* (*quadragonus*); the centaurea and the *Statice pruinosa*, or sea-lavender, were the only vegetation which had resisted the long drought. Beyond the point we turned abruptly towards the sea, thus taking 5 to do the work of 3 hours. The distance by the Ad. Chart is 11 direct geographical miles: we estimated our *détour* at  $15\frac{1}{2}$  stat.; and the odometer, an Austrian *messrad* or wheel (Willmann, Wien), which lost no time in breaking down, showed 22 kilom. 700 metres. Most of the instruments, I must here explain, were bought at Cairo, which appears to be the general receptacle of European rubbish, all sold at double the Paris prices. Consequently they were as useless as they were costly. The mercu-  
 rial barometer (Elliott Bros. 24) lent to us by General Stone (Pasha), Chief of the Staff, Cairo, when opened contained amalgam, not mercury; the *baromètre anéroïde* was found in its box with the chain-hook broken; the maxima and minima thermometers were absolute trash, and the two watches, "Dents" made at Geneva, presently refused to go. Fortunately I had my little travelling set by Casella; and even his maxima and minima were too delicate to resist camel-jolting. General Purdy Pasha of the Egyptian Staff, who remained upwards of two years surveying Dar For, found, after many a trial, that chronometers in those countries travelled best in panniers on donkey-backs. In India we sling them, Banghy-fashion, over men's shoulders; but here and in Africa, the patient coolie's place is taken by a rough and reckless article, utterly unworthy to be trusted with anything more delicate than a cooking-pot.

*Dec. 22nd.*—Of the three first marches I have little to say: they are already described in 'The Gold Mines of Midian.'\* We spent the early morning in digging at the small square fort which occupies rising ground on the left jaw of the Wady Tiryam, and which protected the townlet to the north. These ruins, like most others in Midian, are denoted by pottery, coarse and fine, which may be of any age, and by scatters of blue-green glass, thick and thin: the latter is comparatively modern, and very different from the almost decomposed fragments, iridescent with damp, which are found below ground. The

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\* For the future I shall call it vol. i., and my second work vols. ii. and iii.

diggings showed stony substructures, but their produce did not explain whether the enceinte is old or mediæval, one of the fortlets thrown up to defend the Hajj route.

The Expedition left Tiryam at noon, following the Pilgrim-track, and, after 35 miles, passed on the right a low range of sandstone-hills, the Jebel Rázi (راضي): the broad-mouthed

Fiumara of the same name supplies, near the sea, a pit of sweet water. As usual along the whole coast of Madyan (north Midian, or Midian Proper), except in one place where the mountains fall sheer into the Gulf of 'Akabah, the surface shows much more Wady-land than divide, and some of the former,

like the Wady Garágarah (جراجرة),\* are of great width,

measured by miles. Wady Sharmá appeared from afar black with thorn-trees and 'Abal (أبل)† (*Suaeda montica*?), a salt-bush

eaten by camels. All these settlements being apparently laid out upon one plan, maritime "residences" for the rich, and inland quarters near sweet water for the slave-miners: I hoped to find ruins at the Sharmá Valley-mouth distant 7 to 8 winding miles from the date-grove at the gorge. Accordingly, the Shaykhs were directed to march towards the shore. As yesterday they had disobeyed, so to-day they obeyed orders, much to our detriment; and, after a long and weary round, when already nearing our destination, they all assured me that there were no remains on the seaboard. I sent MM. Clarke and Duguid to ascertain the truth, and they found only a line of high loose sandy dunes. If the Sharmaites built anywhere on the coast, it must have been on the south-eastern side of the great 'Aynúnah Bay, the place called Musaybat Sharmá, provided with a brackish well, and some two hours' distant from sweet water. The march to the "nakhil," or Date and Dom-grove of Sharmá, which does not appear in the Admiralty Chart, occupied 4 hours, 3 hours being the number assigned to the pilgrims. The distance, assuming the mules to walk  $3\frac{1}{2}$  stat. miles for the first half and 3 for the second, would represent 13 stat. miles.

Dec. 23rd.—We set out late this morning in consequence of a visit to the foot-hills behind the sea-cliff, which showed a small outcrop of copper. The swampy Wady Sharmá, whose gap is about  $\frac{2}{3}$  of a mile wide, cannot be ascended by camels; and the same is the case with the Wadys 'Aynúnah and Makná. On

\* Plural of "Jarjúr," a large, bulky or big-bellied camel.

† "Abal" in classical Arabic means a plant with slender sprigs, twisted or imbricated leaves. "Abál" is the mountain-rose, eglantine or sweet-briar: according to some, the rod of Moses was an "abalah."

the return march, Mr. Clarke and Lieut. Amir went directly down the gorge, finding, after 20 miles ride, an S-shaped channel, with water at the head, rising from under the rock, and producing a fetid growth of sedge and the rushes called *El-Kasbá*-(قصباء) (*Arundo donax*) and *El-Birdi* (a flag). Farther down, the line is choked with palm-trees and their dry fronds. The travellers came in, after half an hour's wade, wet through, and dragging their dromedaries, which had much trouble to follow them. Perhaps the most effective of M. Lacaze's sketches, and certainly those most admired at the little exhibition which was opened at the Hippodrome, Cairo, was the water-scenery of Wady Sharmá. It was a surprise to all, and a practical rout of all preconceived ideas upon the subject of arid Arabia.

There are two camel-roads from Sharmá to the Jebel el-Abyaz, the focus and centre of the quartzose outcrop in this part of Midian. The southern was inspected by M. Philipin; it runs over parti-coloured hills, black and white, red and green; about half-way is a well, but the total distance measures 6 instead of 4 hours' march. The northern and best road, which we now took for the second time, crosses the two branches of the Sharmá water, ascends the right bank, and leaves to the left an ancient Bedawi cemetery, with the ruins of a heptangular demilune, possibly intended, like those above Wady Tiryam, to defend the western approach. Flying surveys of the lower and the upper fort were made by Lieuts. Amir and Yusuf, who alone are responsible for their correctness. The former measured in circumference 2085 yards (*not* several kiloms., vol. i. p. 269). The north-east part of the enceinte showed signs of metal-working, and here desultory digging yielded ashes, charcoal, and broken pottery.

After 35 minutes' riding along the seaward face of the coral-line *berge* which forms the old coast-line, and which from afar looks regular as artificial earthworks, we turned to the right through a "Báb," or gate, measuring 70-80 yards (*not* "200 mètres"), cut by a torrent which evidently has not flowed for years. Once it must have discharged into the splendid Bay of Aynúnah, which, nameless and placeless on the chart, was so scandalously libelled by the Greek Agatharkides, as preserved in Diodorus Siculus and Photius.\* The western spit is called *El-Malláhah* ("of the salinas"), salt being still washed there. The anchorage behind it is the Musaybat Sharmá. By this

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\* Vol. i. p. 183.

way, doubtless, ancient Sharmá communicated with the Gád (جَاد)\* or Marsá Khuraybeh, under the eastern spit, before noticed as the maritime settlement of 'Aynúnah. It is open only between the west and the north-west; here, too, reefs and shoals allow only a narrow passage, but admit the largest craft. Its breadth across the mouth measures over 3 miles, and the depth inland, useful for refuge, is very nearly 2 miles. When the silver-ores of the country about the Jebel el-Abyaz shall be exported, this fine port will be the terminus of the tramway. The depth may average 10 fathoms; and our Sambúk, El-Musahhil (Rais Ramazán), a native boat of 50 tons, which acted tender to the *Mukhbir*, rode in perfect safety close to the shore of the Musaybat Sharmá.

The tram should be simple and economical, like "The Economical," proposed by Mr. Russell Shaw, or "The Pioneer," invented by Mr. John L. Haddan, M.Inst.C.E. It must be able to turn sharp curves and follow the valley-line now to be described. We wound up the gut, whose bright yellow sands were set off by the bounding hills and hillocks of gloomy bottle-green porphyritic trap which, throughout this part of Midian, cuts through every kind of rock, quartz-veins included. After an hour and a half's ride, ruddy porphyritic trap and pink grits, an old decomposition, begin to prevail, and give a somewhat livelier aspect. In places there are outbreaks of syenite-like granite, rich in orthose and poor in mica. Here is "El-Muhásir,"† a long oval basin measuring some  $5\frac{1}{2}$  by  $1\frac{1}{4}$  miles, between north-south ( $160^{\circ}$ - $340^{\circ}$  mag.) and east-west ( $30^{\circ}$ - $250^{\circ}$ ). It is the head of the Wady Sharmá proper; and the tail of the Wady el-Maka'dah (مَقْعَدَة), "of the sitting-place"). At this point both water-

courses anastomose with the Wady Umm Níran and the Wady 'Aynúnah; in fact the whole country is a network of these fumaras and nullahs, dried-up river-fissures, watercourses, and torrent-beds. The compass showed the head of El-Malláh at  $250^{\circ}$  (mag.), and that of Sharmá, distinguished by a long line of reddish sand, bearing  $160^{\circ}$  (mag.). Here vegetation—*Artemisia*, *Caidbeja*, *Centaurea*, &c.—was more abundant, and we found a small flock of sheep and goats, the Bedawi in charge asking Cairo prices, \$3.50 for a mere lamb.

From El-Muhásir we entered the Wady el-Maka'dah that leads to our destination. Now the light-red and dark-green

\* "Jádd" would mean land or palm-groves worth so much. "Jáddah" is the beaten part of a road or a high road.

† Meaning "the besieger," or one that surrounds.

sides, often cliffy, of the great Wady are varied by grey granites of fine and coarse elements, profusely streaked with white quartzose veins; whilst the "hard heads" and boulders, in and near the bed, are weathered into quaint shapes of skulls, human and bestial. On the left bank was El-Dabbah, a remarkable rock, looking like a ruined tower. We observed that the hillocks beyond the right bank showed sundry outcrops of snowy quartz, and a lump rose in the valley-side about an hour from our destination. The Bedawin call this rock *Marú* \*

(مرؤ), hence the Jebel "Marwah," near Meccah, and the famous old Marwah gold-mine, which we shall inspect at the end of the journey. The whole formation, of which the Jebel el-Abyaz is the pivot, must be called the Jibál el-Bayza (White Mountains).

The heat of the sun became troublesome, where the abrupt bends and the long legs of the Wady excluded the sea-breeze so pleasant near the mouth. The ride, however, was cheered by the noble background of the picture, the Jebel Urnub.† This sharp-edged main wall is capped with what we called "the Pinnacles," finger-like projections, finials to a huge slab, with an eastern face absolutely perpendicular, and measuring by the eye at least 1000 feet. South of it appears a great nick, the Wady Simákh (of Sumach?), with its huge valley seaming the plain; and yet farther south are "the Buttresses," three enormous flying *arcs-boutants*, with capped heads like logan-stones; they seem to support the rampart, and make a splendid show. The Wady was bare of grass, which does not begin to clothe the ground till February. In one place the rain had formed a veinlet in the lowest part of the sole, and everywhere the sand was damp a few feet below the surface. Had I received the Norton's Abyssinian pumps applied for at Cairo, we doubtless should have struck water; two pits 6 feet deep yielded no results, and yet in most Wadys a tenacious clay, well fitted for building purposes, underlies the sands. After 4 hours' ride (= 12 stat. miles), we camped upon our old ground at the head of the Wady el-Maka'dah, 800-900 feet above sea-level, the mean of 19 aner. obs. (Dec. 23-30) giving 29.10 for the alt. of the camp. We are now on the north-eastern face of the Jebel el-Abyaz, or "White Mountain," described in my first volume

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\* "Marw" (Arabic and Persian), according to the dictionary, is a species of hard white *flint* full of fire. The form "marwat" applies to a single piece; it is also the name of a hill in Meccah.

† All the Bedawin thus pronounce this name; but it may be a corruption. Arnab (ارنب) in Arabic is a hare or a long-tailed field-mouse; and these trivial terms are popularly applied to the largest natural forms. So Camarones, "the Shrimp mountain" of old, the "Theon Ochema," in West Africa.

(chap. viii.). Its distance from the port, with a most liberal allowance, would not exceed 14 stat. miles.

We stayed six days (December 24 to December 30, 1877), at the Jebel el-Abyaz, and water was a serious difficulty for a caravan numbering a hundred mouths, all included except the mules. None was procurable nearer than the great Fiumara Simákh; an hour and a half's march for camels. The gorge is called El-Asaybah (أسيبة)\*; the rhumbs to it from camp were 120°, 90°, and 20°, with a short climb to 120° (all mag.). Under the circumstances the supply, merely rain-water, was so scarce that we could not wash our specimens before returning to Wady Sharmá. Flocks of sheep and goats suggested that there were pools or springs nearer camp; but if so the secret was well kept. At this season the Bedawin content themselves with "Themáil," temporary deposits formed by the showers; and, moreover, like the North American "Indians" of the Far West, they cunningly hide their treasure. The very children instinctively affect ignorance of water. The reader, however, must not confound with the true Bedawin these ignoble half-Fellahs, these "jumpers of walls" (*Nuttát el-hayt*.)

The scarcity of water, so common in mining regions, should present no difficulties at a distance of 14 miles from the sea. The poorer ores could be washed in situ by the *cribles continues à grilles filtrantes* (MM. Huet et Geyler), which uses the same fluid again and again (pp. 378-382 'Géologie Appliquée,' by M. Amédée Burat: Paris, Garnier, 1870); while the richer, that are worth transport, could be "tram'd" down to the sea.

The delay gave us time to correct the errors of our flying visit, and to collect the quantities of specimens required by H. H. the Viceroy. The Jebel el-Abyaz, a saddle-back with pommel and crupper disposed east-west, is 250 feet (not mètres), above our tents at the foot; the aneroid below, showed 29·10, and above, 28·85 (to 28·90), diff. 0·25. The vein of argentiferous, cupriferous, and titaniferous iron, forming a conspicuous black notch on the western side, does not bifurcate, as we supposed, in the interior; the fork which appears in the hinder part is of green porphyritic trap, heavy and also apparently metalliferous, when in contact with the granite. This *Grand Filon*, as we had called it, was analysed at Cairo by M. Gastinel-Bey; and the results per cent., were—

(Titaniferous) iron .. .. .	86·50
Silica .. .. .	10·10
Copper .. .. .	3·40 (2½ per cent.)
And silver 1000, that is from 10 <i>l.</i> 10 <i>s.</i> to 12 <i>l.</i> per ton.	

\* "Isabah," in Arabic, would mean filling a well or cistern.

The Jebel el-Abyaz, the type of the many detached formations scattered over the slopes between the sea and the Gháts (maritime mountains of Midian), is composed of coarse grey granite, everywhere cut by *filons* and *filets*, primary and secondary, of amorphous quartz, with a brilliant snow-white fracture, varying from a thread to many yards in thickness.

Standing upon the crest, which runs west-east and then bends southwards, you see five dykes or outcrops of dull-green porphyritic trap to the east and one to the west, cutting right through the hill from north to south; and showing upon their decayed crests concentric circles like ropy lava. The sandstones of the middle height are superficially revetted with iron; and about the base fragments of hard felspathic stone and lithographic calcaires are rich in dendrites.

The complication of the country is everywhere so great that each day brought its novelty; and months would be required to exhaust the study. As the subject is rather geological and mineralogical than geographical, I shall not attempt a detailed notice, but simply extract from my diary notices of the minerals observed at the "White Mountain."

*Christmas Day*.—Carbonate of manganese; quadrangular crystals of carbonate of lime; copper-ore from the hillocks to north and south-east of camp.

*Dec. 26th*.—Ahmed El-'Ukbi brought in fine specimens of iron-ore (hematite) from between the Jebel el-Abyaz and the Wady Gharr or Upper Wady Sharmá. M. Philipin also collected at the head of the Wady Simákh a heavy, coarse, black sand, partially crystalline with yellow-brown quartzose fragments. Our engineer vainly attempted to analyse the metallic residue. We afterwards found it in almost every Fiumara-mouth, between the coast-range and the sea; and running north as far as El-'Akabah, whilst, with few exceptions, all our washings of red earth, chloritic sand and bruised conglomerate, supplied this and nothing else. It is equally abundant, they say, in Africa, opposite Arabia. We could only suspect that it was the produce of the granites and syenites, especially the former. Colonel W. A. Ross (author of 'Pyrology') presently determined by the magnet and blowpipe that the mineral is iserine, or magnetic ilmenite (titaniferous ironsand), containing about 88 per cent. of iron (magnetic and sesquioxides), with 11 per cent. titanic acid. Other assayers have suspected a trace of lead.

*Dec. 27th* was a day of discovery. We all mounted mule to inspect the site whence some specimens of pavonine quartz had come into camp. Following the Wady 'Efriya (عفريا)\* round

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\* "Ifriyah" means a lion's mane, a cock's hackles, or a bad violent man.



the north and east of the Jebel el-Abyaz, and leaving to the left the Jebelayn, or "twin-peaks" of grey quartz, which bear from the pivot  $71^{\circ}$  and  $96^{\circ}$  (mag.), we fell into the great Wady Simákh, that drains the gap or cut between "the Pinnacles" and "the Buttresses" of the Urnub Range. After riding some 2 miles to the south-east ( $123^{\circ}$ – $129^{\circ}$  mag.) we hit upon two wall-like fragments of dark, dusty, iridescent and metallic quartz, emerging from the plain, and bearing  $324^{\circ}$  from each other, that is north-south—an important point according to some miners—with  $36^{\circ}$  of westing. The dip was western,  $15^{\circ}$ – $20^{\circ}$ . These are the conditions which, I believe, Australia loves, and which enabled Ballarat to make her fortune. The veins break out of the normal grey granite dyked by porphyry; and even superficial specimens show a fine coppery and pavonine lustre. Half a mile beyond it lie two other *filons*, the last bearing  $307^{\circ}$  from the Jebel el-Abyaz,  $317^{\circ}$  from the two wall-like fragments, and  $224^{\circ}$  from the Jebelayn (all mag.). These outcrops suggest that the whole plain is underlaid by quartzose dykes and veins. On our return to Sharmá, M. Marie took from one of the geodes a pinch of dust weighing about half a gramme ( $= 7\frac{3}{4}$  grains), and cupelled a bright pin's-head not less than two centigrammes. Incontinently pronounced to be silver, it might have been antimony or some similar base metal. On the other hand, the silver discovered in the *Grand Filon* by so careful an experimenter as Gastinel-Bey; and the fact that we are here on the same line of outcrop, and at a horizon at least 300 feet lower, are distinctly reassuring. These considerations induced me to call the vein *Filon Husayn*, after the Prince who had so greatly favoured the Expedition.

At this centre we had apparently hit upon the *Negros*, or quartzose formations in which silver appears as a sulphure; and in the geodes we had found the *Colorados*, or argillaceous deposits that produce the metal in the form of chlorure, bromure and iodure. Such is the distribution of silver in Mexico, according to M. Guillemin, C.E., in his *compte rendu* to the *Exposition* of 1867.\* The former is everywhere found in Midian, but it would require shaft-sinking for several hundreds of feet. Here and there the accidental exposure of the veins at a plane far lower than our means and appliances could reach, showed the extent and quality of the outcrop. Below the iridescent rock I should expect to find virgin silver in the

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\* This is quoted (p. 229) by M. Amédée Burat (already noticed): the latter, however, places Mexico in *l'Amérique du Sud*. The volume is a useful *vademecum*, although old-fashioned, and even obsolete, in certain details. For instance, the "crust of the earth;" the great "central fire;" and the granites being the base upon which the strata were laid down; consequently, the earliest of all rocks, when in many places they are the most modern.

arborescent shape. Above its level, as on the summit of the Jebel el-Abyaz and generally in the "Marú" hills and hillocks of Midian, the quartz is comparatively barren, showing specks of copper, crystals of iron pyrites in little blocks, and dark dots of various metals that still await analysis.

*Dec. 28th.*—MM. Marie, Clarke, and Philipin rode on dromedaries 10 miles north to near the foot of the Jebel Zahd; the only ores brought back were iron and manganese.

I at once suspected and afterwards ascertained that the quartz of the Jibál el-Bayzá, the collective name of this outcrop, is not a local peculiarity, but that it everywhere bursts the maritime plain and the foothills of the Gháts or coast-range. And here we have a solid square of 12 (4 × 3) miles, where the quartz appears in hills and hillocks, whilst the plain is probably underlaid by veins and veinlets of the same metal. The "Marú" accompanied us to our farthestmost southern point, where we found undoubted proofs that the iridescent variety had been carefully worked by the old miners.

The health of the Expedition became seriously affected by tent-life; by the variations of temperature, ranging between 92° during daytime and 45° (F.) at night, 60° being often a piercing cold in the desert; by the excessive dryness of 800–900 feet above sea-level; and, perhaps, by the water charged with mineral matter. The officers who visited the Wadys at the foot of the main chain complained of being frozen when exposed to the wild gusts which poured down the gullies. As soon, therefore, as we had finished collecting specimens (1 m. 50 × 2 m. × 1 m. = 4 tons) from the Jebel el-Abyaz, and the same quantity from the *Filon Husayn*, we left this fine mineral tract. We reached the mouth of the Sharmá Valley on December 30.

The Expedition remained at Sharmá during the week ending with January 7, 1878. Our work chiefly consisted of washing the black, red and yellow sands in a rough trough; camels were sent to bring down the metal from the Jebel el-Abyaz; and we made frequent excursions into the interior, everywhere finding *negro-quartz* and traces of copper, raw and worked.

On New Year's Day Lient. Amir, with our guide Shaykh Furayj and some soldiers and quarrymen as escort, set out on dromedaries to survey the line of route abutting upon a mountain of "Marú" (quartz), of which we had heard at the Jebel el-Abyaz. The way ran to the south of the swamp that forms the Sharmá "Báb," and the Wady proved to have four distinct names: Sharmá, near the sea; Gharr or Ghurr,\* (غر) also

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\* "Gharr" here would mean either camel-tending, or where water sinks.

el-Daum from its "Theban palms," on the meridian of the White Mountain, and Urnub (of the hare?), where the pin-nacled and buttressed ranges allow it passage; while the whole is called El-'Amr, after a sub-tribe of the Beni 'Ukbah, its former owners.\* Higher still, the Fiumara becomes the Wady el-'Alas (علص), and under this name drains the hills below the western Hismá (حسمي): it is then a mere gorge

with *ronds-points*—wide bulgings in the bed.

Travelling 7 hours at the rate of 3 miles each, with a long leg in an eastern direction, Lieut. Amir and his men camped, about 4 P.M., in a Fiumara, the Sayl Wady Nakhlah. The upper bed is said to boast of palms, thorn-trees, and grass; the little party had water in barrels, but they were incommoded, despite a large fire, by the intense and bitter cold, while the boisterous wind blew down their tent. Five hours' march on the next day finished the mountain-pass; and, turning to the E.S.E., the path placed them at El-Jahd (of "struggling," of "overloading"), where stood their destination, the "Marú." This was a solitary long-oval, four or five times larger than the Jebel el-Abyaz; and of the same formation, as the specimens of quartz and grey granite showed. It had a broken outline, with four great steps or dykes which had apparently been worked. Here the inland parallel range was seen for the first time. The Bedawin as well as the citizens make a distinction between the Jibál el-Tihámah, the splendid range towering above the coast; and the Jibál el-Shafah (شفاه)† or Lip Mountains—not El-Shifáh (شفاء) of healing—which lie behind and east of them. In the valleys at the base, and spread over the land generally, was found a heavy yellow sand, calcareous and full of silex, which the people called "Awwal Hismá," or the beginning of the Hismá. This discovery prolongs the visible quartz formation to 22–25 direct miles south-east of the main outcrop.

Having cut their shoes in securing specimens, the party remounted; and, taking a line parallel to the former march, more southerly and more direct, they rode in two hours and a half to a Bughaz or ("gap") called El-Halikah,‡ the Huleika of Wallin's map. Here water was wanting, and all went supperless to roost. In the Wady Urnub the Ma'ázah, of the

\* See chap. vi. of my vol. ii.

† Always so pronounced: in classical Arabic Shifah (plur. Shifáh) is a lip. Shifá is healing, and shifá'ah intercession.

‡ "Halik" may be derived from "Halk" the name of a medicinal tree, or from "Halk," the fauces, narrows. "Hulaykah" would be the dim. form.

clan Salimát, received the strangers with outward kindness, inwardly grumbling at their spying the land; and especially welcomed Shaykh Furayj, who, being a brave soldier, is also noted as a peace-maker. All the men were armed like, and wore the same dress as, the Huwaytát; also breeding camels and asses, they are not "Cow-Arabs."

About three hours (= 11 miles) from Sharmá camp the guide pointed out in the Wady Rátiyah some pyramids of sand: the Bedawin call them Goz el-hannán (meaning *butte*)\* and declare that when the Hajj caravan passes, or rather used to pass that way before A.D. 1520, a Naubah or orchestra would sound loud within its bowels: the same is said of other places, especially of a stony buttress near the glorious Shárr. The legend reminds us of the Jebel el-Nákús or Bell-Mountain in the Sinaitic peninsula; not to mention the roaring of the Irish Lia Fail ("Stone of Destiny"); the Reg-i-rowán of Afghanistan; and many similar phenomena. As the Arabs perform visitation and sacrifice lambs to the "Moaning-heap," the superstition probably dates from ancient and pagan times.† Ruins are reported to exist on the Jebel-Fás (of the hatchet), the southern boundary of the Urnub Valley; and I was told by some Arab, whose name has escaped me, of a dolmen, mounted upon three supports, lying farther south, on the Jebel el-Harb. Lieut. Amir also brought copper-ore from the Wady Urnub; and from the Ras Wady el-Mukhbir specimens of a metal which the Arabs declare serves them as kohl, stibium or collyrium. It proved to be not antimony but iron. The latter is everywhere abundant, despite the tradition of the classics;‡ even the carbonate of lime was found, here and elsewhere, infiltrated with carbonate of iron.

At Sharmá I resolved upon dividing the camp; and leaving there Lieut. Yusuf, MM. Duguid and Philipin, the dragoman and the waiter. The quarrymen and miners were charged with washing the several earths and sands, with hunting for specimens, and with transporting sundry tons of the black sand to the Sambúk stationed at the Musaybat Sharmá. This done, they were to rejoin us at the next pilgrim station, Magháir Shu'ayb.

*January 7th, 1878.*—A walk of 2 hours 40 minutes (= 7 miles) northwards, by the Hajj road, and mostly along the shores of the glorious bay,§ transferred us to well-remembered 'Aynúnah.

\* "Kauz," here pronounced *goz*, is a round heap, hill or high tract of sand.

† See my vol. i. p. 182, for the heathen fane and its healing waters.

‡ Vol. i. p. 258, note †.

§ Burckhardt and Rüppell, in part followed by Beke ('Sinai in Arabia.' London: Trübner, 1878), write *Aiyúnah*, *Aiune* and *Ayoun*, all incorrect. The 'Sailing

In places the sea washed over slabs of the fine old conglomerates which, in this country, line the jaws and soles, the banks and sides, of all the greater Wadys: it is the Portuguese *Cascalho*, a pudding of pebbles, water-rolled stones of every size and kind, basalt alone excepted, compacted by a hard silicious paste, which is, in the Brazil, pounded for metal. In front extended far into the blue sea a long yellow point, Ras Jiyál or "circumambulation" (جِيَال), pronounced "Giyál," where

we heard of palms and brackish water. It was afterwards visited by Lieut. Yusuf. We then turned to the right, crossed the dark-brown foot-hills of the old coast, and presently saw the grey-green palms, and the "gate" of 'Aynúnah, light yellow with coralline. The whole distance from El-Muwaylah to 'Aynúnah is covered by the Hajj-caravan at one heat in 12 hours: the pilgrims start about 2 P.M., and they reach the camping-ground early next morning.

*Jan. 8th.*—We gave one day to working and inspecting a vein, Jebel el-Fayrúz ("turquoise hill"), as the Arabs called it; of whose copper silicates, promising specimens were brought by a Bedawi, 'Ayd of the Tagaygát-Huwaytát clan. Ahmed Kaptán presently visited it, and found the site 3 miles from camp, and bearing 102° (mag.). He crossed the Umm Nírán Valley, the general recipient of Nullahs on this line, and made three legs, 1, to 135° (1 mile); 2, to 180° ( $\frac{1}{2}$  mile); and 3, to 145° ( $1\frac{1}{2}$  mile), ending at the site called Jebel el-Fara' ("of climbing"). This hill, bearing the chrysocolla,\* is bounded southwards by the Wady el-Fara', and north by the Wadys Maríkhah† and Umm Nírán. It is an oval about 120 feet high, and 1920 yards in diameter from N.N.W. to S.S.E. I afterwards despatched Lieut. Yusuf to make a detailed survey of the spot; and other particulars will be given further on.

*Jan. 9th.*—We left 'Aynúnah at 6.45 A.M. by the Hajj route winding between the old sea-cliffs and the shore. After one hour (=3 miles) we took a short cut, turning to the right up the

Wady el-Mukhassib (مُخَصَّب) ("the fruitful or rich"), whose few yards of "wa'r," or strong ground, render it unfit for the

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*Directions of the Red Sea* (p. 136), repeating Wellsted, gives the right details. Dr. Beke's sketch (p. 327), makes the tents far too prominent a feature, and does not preserve the characteristic forms of the mountains in the background.

\* The chrysocolla of the ancients is, strictly speaking, a carbonate (not a silicate) of copper.

† "Markh," here generally pronounced *marákh*, is given in the dictionaries as a "kind of Arabian tree which emits fire when rubbed by another, called 'afár."

Takhtrawan ("litter") and heavily-laden animals. On the left stands the quarry-hill of the same name, and further north its "hamirah," or red attachment. Higher up, the gorge is of loose sand; the walls are grey granite and green porphyritic trap; and water must be near, as we found Arab tents at the head. We then issued into the open, and came upon the great caravan track, which, running in a general north direction, is distinctively marked by wavy parallel lines of white sand in the brown-black metal overlying it.

The view was now familiar. Fronting us the northern horizon disclosed the well-remembered forms of Tayyib Ism\* ("good in name"), backed by the far grander Mazhafah,† rising abrupt from the Gulf of 'Akabah, and both trending inland towards their highest points. This mountain apparently is the Jebel Suwekhed of Dr. Beke's map. To the north he places a Jebel Taurán, whose name was not heard; it belongs to the days of Robinson, and the cañon-like gulch identifies it with the Jebel Tayyib Ism of the Arabs.‡ On our right swelled the unpicturesque metalliferous heap of chocolate-coloured Jebel Zahd ("of devotion"), whose "nick," or *Brèche de Roland*, seems to show from every angle. Behind it, the second distance consists of some pale-blue forms, the Jebel el-Lauz (Almond Mountain), evidently the "Tayyibat Ism" of the Admiralty Chart: it is said to take its name from the trees growing, we were told, high up in the clefts and valleys;§ they are probably bitter, like those which flourish in Moab and at St. Catherine's, Sinai. Between the Lauz and the Jebel Muniah ("the exalted"), its northern pro-

longation, is the Sha'ab Hurub (حروب), where the clan Amírat (sing. Amír) camps and finds water some 2 hours' march from the road. The regular cone, El Maklá (مقلا), ends the prospect to the north-east—I could not find the meaning of the word.|| To the west, marked by the chaos of mountains composing Sinai, rose the azure middle knob of three-headed

\* "Tayyibat Ism" in my first volume was a mistake: purists, like our friend Shaykh Farayj, avoid it. There is a Nakb-Tayyibat el-Ism farther south, and in the Buhayrah province of Egypt is a hill (and village?) entitled Tayyibat el-Ism, from its excellent air.

† Probably so-called because it "yazhaf" (يزحف), i.e. advances gradually upon the sea.

‡ See vol. i. p. 329.

§ Concerning these almonds, see 'Notes on a Collection of Plants transmitted by Lieut. J. R. Wellsted.' By John Lindley, Esq., F.R.S., &c. Appendix, vol. ii., Wellsted's 'Travels in Arabia.'

|| Makli (مقلي) signifies the *rouget*, *barbone*, or red mullet.

Tirán Island; the broken crests of the "Red Hills" behind Makná, and the dark peaks of the Kalb (قلب) el-Nakhlah: the two latter look like reefs or islands of black and purple hue swimming in a sea of greenish-yellow secondaries, carbonates and sulphates of lime, gypsum and coralline.

Passing El-Suwayr ("the little wall"), a flat where camp the Maghrabi pilgrims, we entered the Wady el-Marákh, one of the many of that name, derived from a plant loved by camels. This watercourse is an old friend that drains the seaward face of El-Zahd, or 'Aynúnah Mountain, and which joins the Fiumara of Magháir Shu'ayb. The mules' hoofs, piercing the superficial sand, showed bright red earth, which is supposed to come from the Hismá. We saw on the left a knot of low ruddy hills, the Turáb el-'Usaylah (عصيلة)\*. It is so-called from a *ghadír*, "hollow," where the sinking of water produces a bald spot, circled by shrubby trees, subcutaneous and metal-green, eaten by camels but rejected by our mules. Here, again, where muddy patches curb the ground, the pump would have done good service. For this half-march of 4 hours (= 11 stat. miles) we carried water, and as there was no drink, so there was no game.

Jan. 10th.—At 6.45 A.M. we attacked the last and longer part of the second Hajj stage from El-Muwaylah. Crossing the Wady El-Koz after 1 h. 15. m. (= 3½ miles), we passed on the left a low, chocolate-coloured block, Umm Rujaym ("mother of the little stone-heap"), which is the true half-way station. Our Arabs, bent upon converting a two days' march into three days' work, punished us by grazing their camels on the road, and by not arriving till the evening. As before, there was no game till we approached the springs, but a clump of large tamarisks and aráks (*Capparis spinosa*) on the right, and a huge samur acacia (*Inga unguis*, Forsk.) on the left, looked well capable of sheltering it. We now began clearly to see our destination, palms and tufty trees at the mouth of a masked Wady running between a background of reddish-brown rock, the foot-hills and sub-ranges of the grand block El-Zánah (ضانه, "of the camel's nosebag") to the north, and a foreground of pale-yellow, barren gypsum, apparently tongue-shaped. Above the latter towered two quoins of ruddy material, "El-Shigdayn" † (شجدوين), which others called "Umm Jarfayn."

\* 'Asal in the dictionaries is explained as a tree which purges camels, the rhododaphne (laurel rose, oleander). Forskål ('Flora Ægypto-Arab.', pp. cxiv. and 110) applies it to the *Ocymum serpyllifolium*.

† The singular appears to be Shigd, synonymous with "Shikk" (شق fissure,

After an hour's halt in a cool breeze under a thorny tree, we passed the Ghadír, or basin, El-Nukrah (نقرة), "the hollow". Resembling that of El-'Usaylah, it is one of the round sinks so common in Arabia, with a bright green growth of grass and shrubs springing from a soil superficially red. Thence, leaving on the left the Umm Gafá (قفا), the "Mother of the Neck-nape"),\* a tall cliff of dull brown, with a white gypseous scar upon the cheek, we fell into the Wady 'Afál ("of the rupture"?). This is the Fiumara of Magháir Shu'ayb, which rolls a torrent once in every ten years or so to the sea between Ras Jiyál and 'Aynúnah Bay. At the mouth is the M'inat El-'Ay'ánát (عيانات, "of the look-out"). This little port for "Sambúks," was afterwards surveyed by Lieut. Yusuf. We hit it at a bend some 220 yards wide, called Aríz (عرض) el-Sidrah, or "Broad of the Jujube," from one of the splendid secular trees which characterise this part of Midian.

Here we found both banks of the Fiumara lined with courses of rough stone, mostly rounded boulders. These are evidently the ruins of the water conduits which served to feed the rich growth of the lower valley. Then the vegetation of the gorge-mouth developed itself to date-trees and daums, tamarisks, and salsolaceæ, especially the 'Abal-bush, out of which scuttled a troop of startled gazelles. We turned the right-hand jamb of the "gate," and found ourselves at the water and camping-ground of Magháir Shu'ayb. The march had occupied 6 hours, whilst the caravan took  $8\frac{1}{2}$ , and we set down the distance at 18 miles (stat.) or 29 from 'Aynúnah.

The ancient Ptolemeian city of *Madíapa* belongs rather to the domain of architecture and archæology than of geography; and I have elsewhere published a full description of the ruins.† It is described by Ruppell (Dr. Eduard) '*Reisen in Nubien*,' &c., Frankfurt am Main, 1829. He gives it, however, only a couple of pages (pp. 219, 387), and an illustration of two catacomb façades (p. 220). The true latitude would be  $28^{\circ} 28'$ , and thus the old Alexandrian geographer is not far wrong with his  $28^{\circ} 15'$ . As regards the name Magháir, "caves," i.e. catacombs of Shu'ayb, i.e. Jethro; it must not be put in the singular

crevice, also the most prominent part of a mountain); the dual would be "Shik-kayn," but the Bedawin convert it to Shigdawayn. Such, at least, is the only explanation which I could obtain. Umm Jarfayn would mean "mother of the two ledges."

\* A name given to hills and mountains with long sloping backs.

† Vol. ii. chap. iii.



"Maghárat;"\* nor is there any cave in which that holy man who, Bedawi-like, had his beat between Makná and this place, was wont to pray. The catacombs are also called in local dialect *Bíbán*, or "doors." Wellsted ('Arabia,' vol. ii. p. 123) had not visited the place when he wrote "at Mahárehi Sho'aib, and at Beden, the former estimated at 5½, the latter 7½ hours' journey (from Makná), there are other ruins." *Beden* (an "ibex") is an error originally made by Rüppell for Bad'a, an "innovation," a "novelty," because a Maghrabi pilgrim here dug a new well.

Wady el-Bad'a (بدع) is the name of the short section of the

Wady 'Afál occupied by the palm-groves. The Jihan-numá (p. 541) of Háji Khalifah, *alias* Kátib Chelebi, who died in A.H. 1068 = A.D. 1658, thus notices it: "Magháir Shu'ayb.† There is sweet water in its pits, a palm-grove, and many athl (tamarisks) and mukl, or daum-trees, like those that grow near the River Nile. There are here also inscribed tablets (*Kawwat* = *tákah*) on which the names of kings are engraved."‡

The ruins of Madiáma may be divided into four main blocks, two on each side of the Fiumara. Uppermost, on the left bank, appears to be a fortified *hauteville* on the Jebel el-Safrá,§ a double quoin of coralline and gypsum striking to the north. Before the western flank was broken down by time, the buildings, as in the Syrian town of Safet, ran up the slope, forming steps, descended the now precipitous eastern flank, and covered the gorge between the "Yellow Hill" and its neighbour. Foundations of houses run along the low level of the left bank for about ¾ of a mile; a number of yawning graves are sunk in the gypsum, and the remains include furnaces and a smelting place. The only sign of standing buildings—all the rest being mere basements—are a Moslem fort, two large *Sákiyahs* (or "draw wells"), a conduit of coarse grit, and a fine *Hauz* ("cistern") of cut sandstone. The group is called Bir el-Sa'idáni, from its builder; and the tradition of the Arabs, here very much at fault, declares this to be the old original settlement, before the "innovating" spring was discovered by the Maghrabi magician.

On the right "Jarf," or raised bank of the valley, are the foundations of a large town, built mostly of gypsum, which has turned snow-white with age. Hence scattered ruin-heaps run

\* This mistake has been made throughout my first volume, and it is copied in Dr. Beke's 'Sinai in Arabia.'

† See 'Háji Khalifah's Route of the Pilgrims,' at the end of this paper.

‡ Only three of the catacombs bore inscriptions, which appeared to be Nabat (Nabathæan): squeezes were made from both.

§ This is the general native name for the light yellow coralline and gypsum; opposed to the Hamrá or Hamirah, the red porphyries, syenites and traps.

some 2 miles down stream. They are isolated by the lateral torrents which, no longer under man's control, sweep down to the main Wady 'Afál. In the hollows formed by the vagaries of the bed antiquities are sometimes picked up; stone weapons, coins of gold, silver and copper, bits of metal, steatite pots, mortars, grinding stones, glass and pottery, beads and similar articles. The three lateral gullies which fall into the right bank contain the catacombs that have given the place its modern name—they were first visited by Rüppell (1822). The "Tombs of the Kings" \* are in No. III. valley; above it is the cliff-top called the "Praying-place of Shu'ayb." Here the aneroid (corrected) stood at 28·94, while it was 29·40 below, (diff. 0·460). Yubú' island bore 173° and Shu'shu' 196° 30', while the camping ground lay at 45° 30' (all magnetic). In a fourth gully, somewhat further down, are specimens of inferior art in a ruinous state.

III. *From Magháir Shu'ayb to Makná.*—During our fortnight's halt at Magháir Shu'ayb we failed to make arrangements for visiting the Hismá; but reconnaissances were pushed to the neighbouring mountains. On January 17, the Egyptian Staff-officers rode up the Wady 'Afál and, within a distance of 3 miles, they found two mining establishments. The broken white quartz, scattered round the furnace, argued that the rock could not be far distant. On Monday, January 21, M. Marie and Lieutenant Amir set out to explore a "White Mountain" of which I had heard chance reports. Leaving the Wady 'Afál to the right or east, they skirted to the left, after 1 mile, the Jebel el-Safrá, or (northern) "gypsum mountain," which bisects the bed of the Wady Makná; and for 2 miles they struck northwards with 5° of westing (mag.) up the Wady el-Khárik (خریق),† whose bed had already begun to bear grass. The route then ascended the Wady Sabil ("of the path"), a Fiumara about one-third of a mile broad, bounded by low hills: after a total of 3 miles large rocks appeared on the left bank; the Samur thorn became common, and the herbaceous growth more luxuriant. After half a mile riding to 345° (mag.) they changed rhumb to 5° west (mag.), where small hills again bounded the Wady. Presently (1½ mile) the Wady Umm 'Arkúb‡ (عرقوب)

\* The name is our own. For a description of them see 'The Land of Midian (Revisited),' vol. i. chap. iii.

† "Kharik" in Arabic is a word of many meanings—"level ground growing vegetation;" a "cold wind," a "shallow canal amongst trees," and "the extremity of a valley opening out."

‡ A narrow mountain-pass, or a track winding through a valley. The classical form is "Urkub," and its general meaning is the Tendon Achilles.

fell in from the east; and opposite to it, or westward, the Wady Sabil forked. Another mile and a third ended the latter; and the travellers attacked the divide over the Jibál el-Sabil. Crossing a small watercourse trending east-west, they entered a plain bounded by the Jibál el-Kuraybeh (كريبه), "of ploughed land";\* and, after  $\frac{1}{4}$  a mile bending west (mag.), they entered an ugly Nakb or rocky pass, running, with many angles and zigzags, due north for about a  $1\frac{1}{4}$  mile. On this line there is no other road; camels can manage it only with half-loads; and even mules found it difficult. The gut abutted upon the Wady Murákh (or Marákh); this Nullah runs from north-east to south-west, and falls into the 'Akabah Gulf near the well-known mountain, Tayyib Ism. The line is easier; and, when the White Mountain comes to be worked from Makná, there will be fewer difficulties of transport. After  $\frac{1}{4}$  of a mile the direction changed to north-east ( $60^\circ$  mag.); and after another mile, making a total of 9 miles (3 hours) in a general northern direction, they came upon the wished-for "Mount Marú." It was backed by the tall, dark and dome-shaped Jebel Zánah (ضانه) the "Dhana" which, together with the "Djebel Hesma," were seen by Burckhardt as he travelled down the Wady 'Arabah en route to Suez. Nearly visible from Magháir Shu'ayb, this remarkable block appeared to me the tallest that we had yet seen: with its eastern prolongation the Lauz, it is probably the "Tayyibat Ism" of the Admiralty Chart. About  $10^\circ$  (mag.) west, near the Sharaf Taur † el-Hismá (the height of the inaccessible side of the Hismá), stood the Jebel el-Muk. Thus they had crossed three several ranges; the Sabil, the Kuraybah and the Murákh, all outliers of the great Zánah.

The Wadys—*fluvii pluviá geniti*—already waxing green, supplied a quantity of trees, shrubs, and plants. Two are not eaten by camels:—

1. El-Rayil (ريل) or Rayl (*Ærua Javanica*).
2. El-Mashtah (مشطه), the "Comb" (*Cleome chrysantha*), whose juice is applied to snake-bites.

The 18 chief kinds, mostly perennials, and all used as fodder, are:—

\* Others called it Kabaydah (of the "little liver").

† This word (ثور) is generally known in the sense indicated. The root would be Tára = "it became raised or spread."

1. El-Lussák (لصاق) or *Caidbeja adhærens* (*Forskalia tenacissima*, Linn.); not to be confounded with El-Lusaf (لصف), the only plant (*Capparis spinosa*) whose fleshy leaves in bright-green tufts veil the bald and ghastly gypsum. I brought home specimens of its gourd-like fruit and its fat foliage.
2. Abu (or El-) Zafrah (ظفره); in the dictionaries it is explained as a "biting plant, good for warts and ulcers." Here it is *Iphiona scabra*.
3. El-'Aushaz (عوشز), properly written 'Ausaj (*Lycium Europæum*).
4. El-Natash.
5. El-Sill (صل); in the dictionaries the "name of a herb."
6. El-Zanabán (*Reseda canescens*).
7. El-Girzi (جرز); the "Gurdhi shrub—a Resedacea (*Ochradenus bacchalis*)" of Schweinfurth(?) and the 'Athenæum,' July 6, 1878.
8. El-Bayáz (بياض).
9. El-Shauk (رشوق), a generic term for thistles, applied especially to the Shauk el-Jemel or camel-thorn (*Blepharis edulis*, the *Echinops sphærocephalus* of Forsk.).
10. El-Siyál; the well-known *Acacia Siyal*.
11. El-Shauhat (شوحط), "a tree whence bows are made," often mistaken by us for the 'Arák (*Capparis*).
12. El-Yesár or *Yesur* (*Moringa aptera*), a tree resembling the athl or tamarisk.
13. El-Warák.
14. El-Zaytah (زيتہ), a *Lavandula*, with pretty blue flower, giving no sign of oil (*Zayt*).
15. Rabul (ربل),\* *Pulicaria undulata*, a chrysanthemum with a yellow flower, much relished by camels both in Egypt and in Midian. I carried back four bottles full, two preserved in oil, with the hope of bringing out an "Essence of Midian."
16. El-Sakrán (سكران), or Saykrán (سيكران), said to in-

\* Forskål's 'Flora Ægypto-Arab,' p. lxxiv., gives Rabad ربد = *Buphthalmum graveolens*.

toxicate those who eat it; the *Hyoscyamus pusillus* of L. I could not see the flower. In Egypt the word is applied to the *Physalis somnifera*; in Arabia to the *Hyoscyamus datura*. The word is identical with the *Sekkeran* (a kind of mallow), noted by Professor Palmer in the 'Sinaitic Peninsula' (vol. i. p. 23): this certainly would have nothing intoxicating in it save the name.

17. El-Kaysániyyeh (قيصانيم), used by women as a yellow dye for woollen stuffs; and

18. El-Kallúm (قلوم), a prime favourite with camels.

The "White Mountain" under Zánah, rising about 1000 feet above S. L., and 100 over its surrounding valleys, commands a fine view of the sea as far as 'Aynúnah. It is a long oval with the major axis disposed to  $135^{\circ}$  (mag.): the circumference may be 400 feet, and the regularity of its contour is broken to the south. The surrounding heights and Wadys, often glittering with mica, contain smaller veins: the travellers brought home specimens of orthose adhering to quartz and mica, flashing in the sun, from the eastern side of the White Mountain. The quartz was sparkling and snowy, like that about Sharmá; the country, however, supplies all kinds of varieties, waxy, amorphous, crystalline, opaque and hyaline, amethystine, smoky and ribbed (*petrosilex*); heat-altered and chalky, pink, yellow, and slate-coloured; one piece showed a curious transition from the opaque to the transparent "rock crystal," easily mistaken for glass. The engineer thought that this time he had struck gold; and a speck was the result of using mercury. But I was haunted with fear and dread of the pyrites, or "crow gold," which has played so many notable tricks on travellers; and, after a few days, the tarnishing of the speck justified my suspicions.

At Magháir Shu'ayb the camp had been much exercised by Bedawin reports of the wonders found in the lands to the north and the north-east. On January 24 I ordered a Tayyárah, or flying-caravan of dromedaries, guided by 'Brahim bin Makkúl, the Amráni-Huwaytát, who had come into camp with his brother Khizr, chief Shaykh of the clan. Mr. Clarke and the two Staff-lieutenants were directed to ride to El-Rijm (the "stone-heap"), the next station of the pilgrim-caravan; and to bring back sketches of a Hajar Masdúd\* (a "stone set in another") from the Wady Zaráfah (ضرافه), and of a tablet adorned with a dragon and other animals. Starting at 7.45 A.M., they rode up

\* Literally, "shut, corked, plugged."

the Wady 'Afál, passing, after 3 miles, the furnace and the two sets of ruins before mentioned, and covering a total of 6 miles in 1 hour 45 minutes. This was not fast work; the Bedawin object to pushing their dromedaries beyond  $3\frac{1}{2}$ –4 miles an hour during the starving season; and they are right: I have seen many falls, the result of mere weakness after trotting a few yards. Red conglomerate appeared on both sides of the bed. The travellers passed the Wady el-Tawíleh ("Long Vale") on the right hand; and at 9.30 A.M. they came upon the ruins of a boulder-built *atelier*, with what appeared to be a *Burj* ("tower"), and a *Fiskíyyah* ("tank") called "Igár Muás" (عجّار مواس).

After the delay necessary for sketching and surveying, the party remounted, and rode up the Wady, bending from north-east to north: at 10.50 A.M. they reached the mouth of the Wady Kahíl, where the aneroid showed an altitude of 1200 feet (28·80). They had now made  $10\frac{3}{5}$  miles (Mr. Clarke boldly said 12) in 3 hours, halts not included; and they were unpleasantly surprised when asked "why they had not brought their tents?" It was then explained to them that they were still one hour short of the half-way point to El-Ríjm; whilst the dragon inscription could not be reached under a whole day. Totally unprepared for a wintry night in the open at such an altitude, they returned *re infectá*; Khizr and 'Brahim incontinently disappeared, and we desisted from reconnaissances to the north of Magháir Shu'ayb.

*Jan. 25th.*—At 7 A.M. we left Magháir Shu'ayb and took the road to Makná, along the fine valley of that name. At 7.45 A.M. the mule-riders crossed the low stony divide separating the Wady 'Afál from the Wady Makná; \* of old called Wady "Madyan." The valley, here very well defined, winds left or west of the well-known ridge Umm Kafá el-Samrá. "Brown" as the name denotes, is a lump of chocolate-coloured carbonate of lime, the weather-gashes disclosing upper white strata (gypsum); and below them, red rock, probably grit upthrust by the plutonic formations. In this region El-Safrá is the generic name of the yellow formations (coralline and gypsum); El-Hamrá, Hamírah or Humayrah of detached ruddy hills, and El-Ash'hab (femin. Shuhbá — نسهب), of the grey or ash-

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\* The word (مقنا) meaning a place where the sun shines not, ends with an Alif, and was adopted from the Arabic by Ptolemy. It was first written with an Ayn by the learned Burckhardt, who seldom makes such mistakes. The hard Káf (ق) pronounced with a "g" (in gorge) by the Arabs, accounts for the popular form "Mugna," and, worse still, "Mugnah" as on the Admiralty Chart.

coloured as granite. On the right bank we saw the gape of the important Wady Sukkeh. At 10.10 A.M., after 3 hours = 8 miles, we halted for rest under a bay or hollow in the cliff-wall called El-Humayrah (حميرة), where the strata of pebbles reminded me of those which in Brazil accompany the diamond.

Resuming our route at noon we entered a sensational gorge: its tall walls, lamp-black and blood-red, are called the 'Abdayn, or two slaves. After one hour and a half we issued from the gully and recognised the coast features. On our right (north) was the gypsum mound Raghámat-el-Margas, forming the staple of the gate; whilst to the south was the Rughaymah (or "little gypsum-hill") amongst the Jibál el-Hamrá.\* At 2 P.M. we turned to the right of the Wady, whose broad bed is made impracticable, near its "gate," by rocks and palm-forest. Here we inspected the Musallat Músá (oratory of Moses), and at 2.30 P.M., after a spell of 2 h. 30 m. = 7 miles, we sighted

"The shifting waste of dim-blue brine  
And fading olive hyaline."

The camp was pitched upon our old ground. The total of this march had been 5 h. 30 m. =  $17\frac{1}{2}$  miles. I have described it at full length in Chapter V. 'The Land of Midian (Revisited)'; and the western section between the sea and the "Red Hills" in 'The Gold Mines of Midian.'†

The stations on our northern line of march were:—

1. El-Muwaylah to Wady Tiryam ..	5 hours.	=	15½ miles.
2. To Sharmá .. .. .	4 "	"	13 "
3. " the Jebel el-Abyaz .. .. .	4 "	"	12 "
4. " Sharmá (return) .. .. .	4 "	"	12 "
5. " 'Aynúnah .. .. .	2 h. 40 m.	"	7 "
6. " El-Usaylah .. .. .	4 "	"	11 "
7. " Magháir Shu'ayb .. .. .	6 "	"	18 "
8. " Makná .. .. .	5 h. 30 m.	"	17½ "
Total .. .. .	35 hours	"	106 "

Thus the average rate of progress would be 3 miles an hour, halts not included.

At Makná we were pleased to meet the gunboat *Mukhbir* and the *Sambúk*, carrying our stores and rations for the men and mules. I found the place charming, and stayed there a week (January 25th—February 2nd) to explore its mineral

\* See vol. i. p. 349.

† In this vol. i., p. 335, I made the distance "seven hours by dromedary or ten by camel = 25 miles."

wealth, by far the most important we had yet seen. It is the very place for a mining settlement: with plenty of wood, and water sufficient for washing ores as well as for cultivation; with regular winds blowing strongly from north and south; a rise of the tide about five feet high—this force could easily be applied to boats as on the Danube and the Adige—and a port open only to the west. The harbour, also described in my first volume, has two natural piers partly worked by the ancients: protected by hills in front and behind, it is safe from the northern and southern gales; and it would easily be defended against the rare but dangerous Gharbís (westers).

The delay again enabled us to correct the errors of our flying survey, and to make a careful reconnaissance of the neighbourhood. For the first time I heard the term *Jebel el-Fahísát* \* applied to the dwarf metalliferous range subtending the shore: it had been miscalled in vol. i. I was also puzzled by the presence of porous basalt which had supplied the first Expedition with a veinlet of natural “electron”—gold and silver mixed. Completely wanting in the Wady Makná, it appears in scatters along the shore to the north. Our guide, Shaykh Furayj, knew nothing nearer than the Harrah or volcanic tract bounding the Hismá on the east. This was going too far, at least five days’ journey; and broken querns † were found in the *haute ville* of Makná. Moreover during last spring I had heard of mining ruins in the mountain Tayyib Ism.

Accordingly, on January 27th, Lieut. Amir was despatched northwards with a small dromedary-caravan under Shaykh Furayj. He wound along the shore where the weathered corallines, grits, and limestones, form the quaintest features, giant pines and mushrooms, columns and ruined castles. After an hour’s ride he crossed the Wady Halífah (حليفه); the tall and well-defined banks of this broad valley, which drains the northern flank of the Raghámat Makná, are of sandstone-grit, imbedding a whole geological museum. The line is said to supply brackish water; none was seen, but there are date-trees in the sole, whilst others cling to the steep banks. ‡ About one mile beyond it is the Wady el-Duwaymah (“of the little Daum-tree”), with a clump of the *Crucifera Thebaica* close

\* The root appears to be “fahis”—belly, tripe, pouch.

† Only one shape was found; the “pot-quern” of the British Isles is apparently unknown in Midian.

‡ After this point all the information is borrowed from Lieut. Amir’s sketches and route-book: of course I am not answerable for their correctness. We had intended to land at El-Hakl and to inspect the line, but the heavy weather in the Gulf of ‘Akabah interposed its veto.



to the sea. Another mile and a third led to the Wady Abi Nakhlah, owning a single burnt or blasted date-tree, and a little beyond it the coast bends from  $25^{\circ}$  to  $30^{\circ}$  (both mag.).

The fourth "Nullah," Wady Kasárah (قصاره "being short"), distant about a mile, shows in two places ranges of stones which bear the semblance of ruins. On the right or east rose the light-coloured Jebel Sukk, which is seen from the heights above Makná; and on the southern bank of the Wady Sukk ("the closed road"), which drains it to the sea, appeared a hill of porous basalt, here called by the Arabs Hajar el-Harrah. The specimens brought home, if they be *bonâ fide*, prove that volcanic outbreaks, detached, sporadic, and unexpected, occur in Midian, as in the limestones of Syria and Palestine, even near the shore. It would be interesting to ascertain their connection with the great volcanic lines in the interior, the Haurán and the Harrah.

Crossing the Wady Sukk, the travellers had on the right hand the Jebel Tayyib Ism. From our camp this chocolate-coloured mass, studded with small peaks, appears a southern outlier of the great blue wall El-Mazhafah, bounding the northern horizon. For a short distance a bad, rough path leads along the "Good Name"—no one can explain the cause of its being so-called—and then the cliffs fall sheer into the sea, explaining why the caravans never travel that way. Thus compelled, the track bends inland to  $65^{\circ}$  (mag.) and enters a Nakb or pass, a gash conspicuous from the gulf, an immense *cañon* or *couloir*, looking as if emptied of its dyke or vein. Curious to say, its south-western prolongation cuts the cliffs near Marsá Dahab in the so-called Sinaitic peninsula. The southern mouth bears signs of habitation: a parallelogram of stones, 120 paces by 91, has been partially buried by a landslip; and there are remnants of a dam measuring over a hundred yards in length. About 300 yards higher up, water appears in abundance; and 25 to 30 palms grow on both sides. Here, however, is not a trace of man; the winter-torrents must be dangerous; and there is hardly any grass for sheep. The gorge now becomes very wild; the pass narrows from 50 paces to 10, and in one place a loaded camel could hardly squeeze through; whilst the cliff-walls of red and grey granite (?) tower some 2000 feet above the path. The same altitude is given by Dr. Beke (p. 533); but he did not remark the prolongation of the *couloir* in the eastern rim of the Sinaitic peninsula. Water, which as usual sinks in the sand, is abundant enough in three other spots to supply a large caravan; and two more date-clumps

were passed—hence, if all here told be true, the “Nakhil Tayyib Ism” reported to me last spring.\*

The total ride occupied 5 hours (= 16 miles). Still the tall blue range peaking to the east, and throwing out a long western slope to the sea, was far off. The caravan had not covered more than half the distance to the Bir el-Máshi, where a small Marsá, or anchorage-ground, called El-Suwayhil (سويحل),

the “Little Shore,” opens to the north of the Mazhafah block. From this “Well of the Walker” a pass leads to the Wady Marshá: in it we had been told of extensive ruins and *Bibán* (“doors” or catacombs), but the whole was invention. Our Sayyid had ridden through it *en route* from Magháir Shu’ayb to El-Hakl, and found nothing.

The second excursion took place on Monday, Jan. 28. The son of one of the guides, Gabr “Kázi of the Arabs,” had brought in fine specimens of quartz from the eastern hills, and offered himself as a guide. At 7.15 Mr. Clarke and Lieut. Yusuf set out to collect exact details of the find. They walked up the Wady Makná, hauling their mules after them; here the low-level fountain ‘Ayn el-Fara’i† breaks out from both banks, unites in a single stream, flowing under the tall right side of carbonate of lime, now bare, then capped by conglomerate, forms deep pools among huge boulders of grey granite, and finally sinks before reaching the shore. Higher up the side is a second water, ‘Ayn el-Iánah (عيا نه “of spying”), springing from the sands under the date-trees that line the right and left flanks. Apparently it is the drainage of a gypsum “hat” called El-Kulayb (كليب); and, above the “little dog,” the right bank is occupied by a “Goz,” or inclined sheet of pure, loose, and rippled sand. Opposite these two features the left bank of the Wady Makná receives the “torrent of the Quartz Mountains,” concerning which more will be said; and higher up, the huge watercourse known as Wady el-Kharaj‡ (*alii* Akhraj), threads the gypsum cliffs. It rises in the south near Umm Giyál, and drains the *Khabt* or *Khabat* (خبت) lands, meaning a low place or plain where trees are beaten for camel-fodder.

Leaving the Wady el-Kharaj to the right, and still striking up the Wady Makná, the travellers, marching towards the “Red

\* Vol. i. chap. xii.

† Fara’i would mean “derivative” or “descending.”

‡ Meaning “a mixture of black and white.”

Hills," reached the Wady Mab'ûg (oblique or crooked valley) mentioned in my first volume.\* This large feature, draining a mountain of the same name, is said to supply bitter water. A bottleful had been brought to us with much ceremony, and those who tasted it were uncertain whether the flavour was sulphureous or ammoniacal. Wishing to have some report about it, I had directed the explorers to ride up the sandy bed till they found the spring. Presently, leaving their mules, they turned off sharp to the right, descended a steep incline, and suddenly entered a chasm in the rocks which here rise about 200 feet high. After a total of two hours' walk and ride, they came upon a pool of rain-water, some 4 to 5 inches deep; it was evidently visited by many animals, camels included, and hence its peculiar flavour.

They then retraced their steps, crossed the Wady Mab'ûg, and going north came upon the "Marû." This network of quartz-veins in sandstone grit (?) was found in the Jibal Umm Lasaf. The block lies behind or east of the Jibál el-Hamrá, the Red Hills to which the first expedition had been attracted by the two pale leprous patches, the *Rughaymeh*, or smaller gypseous formations.† No. 2 excursion was interesting: it proved that the "white stone" is found to the east as well as the south of Makná.

A Bedawi named Jázi had brought us fine specimens of brimstone, pure crystals adhering to the gypsum, and possibly formed by decomposition of the sulphate of lime. If this be the case we may expect to find the mineral generally diffused throughout the Secondary formation. Naturally it will be richer in some places and in others poorer. Further investigation in Midian introduced us to two other deposits; making a total of three, without including one heard of in Northern Sinai, and thus rivalling, if not excelling, the riches of the opposite African shore. I need hardly dwell upon the importance of a brimstone much resembling that of Sicily: its price seems steadily to rise, and it is held to be worth importing from distant Iceland. Strange to say, the Bedawin of Midian buy their sulphur from the "Barr el-'Ajam" (Egypt), and thus the diggings will be found virgin.

On our first visit, we had heard of a *Jebel el-Kíbrit* ("sulphur hill") on the road from Makná to 'Aynúnah, but there was no one to show the place. This time I was more fortunate. On the morning of Jan. 26th a caravan of four camels, for the two quarrymen and the guide, set off with their sacks and tools. They did not return till the morning of the third day, having

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\* P. 351.

† Vol. i. p. 349.

lost the road. Of course they could not ascertain the extent of the sulphur deposit, but they brought back rich specimens, which determined me to have the place surveyed. This gave abundant trouble, as will appear in due time; the second attempt was a dead failure, and it was not till February 18th that I could obtain a satisfactory plan of the place.

Meanwhile we were working hard at the discovery of the northern march. A full account of our ludicrous disappointment has been given in the 'Land of Midian (Revisited).' Suffice it here to say that a quartz vein emerging from and in close contact with the green and red porphyritic traps and plutonic outcrops of the Jebel el-Fahisát (فحيشات) yielded to the rudest cupellation some 28 per cent. of metal, which proved, however, to be iron not silver. But the block contains other ores; and it is in the most favourable condition for working: water and wood abound; the winds and tides are regular enough for mills, the distance of the quartz crest is hardly two miles from the little port, and a *luft-bahn*, or air-tramway, would discharge the ore into the ship's hold. In my first volume (chap. xii.) I have incorrectly called the "Jebel el-Fahisát," confounding it with a small red hill to the north of our camp, *El-Muzaydní*, and this also is an error for *El-Muzéudi* (المزودي). The former, a long dark block running parallel

with the shore, is flanked to the east by the Secondary formations, the Jebel el-Kharaj and others; beyond them, however, lies the similar plutonic formation, the Kalb el-Naklah; and, still farther east, another rises—the great maritime wall of the Jibál el-Tihámah. The Fahisát seems to abound in all manner of metals. The quartz form pushes northward veins distinctly cupriferous, imbedded in grey granite. To the east of the block, distant about a mile, appeared fine micaceous iron, and more green quartz, of which a third deposit was found within a mile farther south. On the day before we left *Makná* (February 2), the Arabs brought in heavy masses of purple-black metalliferous rock scattered over the southern gorges and valleys, while others declared that they could point out a vein *in situ*. Finally, red marks in the stones suggested cinnabar.

*Jan. 28th.*—At 11 P.M. set in a furious norther, locally called *El-Ayli* (إيلي), the 'Akabah-Aylah wind; whose effects have been well described in Wellsted's second volume. The storm began with a rush and a roar; the gravel striking

the canvas sounded like heavy rain-drops, and it instantly levelled the two large tents. This gale makes the air exceptionally cold and raw before dawn; it appears to abate between noon and sunset; it either increases or lessens in turbulence with moonrise, and it usually lasts from three to seven days. The gunboat *Mukhbir* got up steam by way of precaution; but she rode out the storm in safety, as the northern reef and the headland Ras el-Tárah (the "surrounder") form a complete defence against "El-Ayli," whilst the natural pier to the south would have protected her from the Azyab.\*

It would have been far different had the storm veered to the west and the terrible Gharbi set in. The port of Makná, described in my first volume, can hardly be called safe; on the other hand, its bottom has not been surveyed, and a simple breakwater—bundles of tree-trunks clamped with iron bands, connected by strong rings and staples, and made fast to the bottom—would convert it into a dock. At any rate, on the opposite Sinaitic shore, at the distance of 13 knots, there is, as will appear, an admirable harbour of refuge.

The three normal days of El-Ayli had come and gone; the storm continued; yet the cloud-veil lifted, and the mountains of Sinai and Midian, which before had been hidden as if by a London fog, again stood out in sharp and steely blue. The sea, paved with dark slate, and domed with an awning of milky-white clouds, patched here and there with rags and shreds of black nimbus-mist that poured westward from the Suez Gulf, showed us how ugly the "Birkat 'Akabah" can look. Meanwhile I boated off to the *Mukhbir* all the specimens brought down by the Expedition, and drew up instructions for Lieutenant Yusuf and M. Philipin.

At last, about midnight (Feb. 2), the tempestuous northerly gale, which had now lasted four days and four nights, ceased almost suddenly. The change was hailed with general joy. The travellers looked forward to ending their peregrinations; while the voyagers, myself included, hoped safely to circumnavigate the Gulf el-'Akabah, and to trace, as correctly as possible, the extent, the trend and the puissance of the quartz formations. I have reason to think that large bands of "Marú" vein the "Old Red" of Petra, and that they may possibly extend, under the waters of 'Akabah, into the peninsula called Sinai.

IV. *Round the 'Akabah Gulf to El-Muwaylah.*—Feb. 3rd.—Nothing becomes Makná better than the view on leaving it;†

\* In classical Arabic "Azyab" means calamity, a south wind or a south-easter.

† In 'The Land of Midian (Revisited),' a full description of the scenery is given in chap. vii.

nor is there any better place for studying the general aspect of the great gypsum formation. The Secondaries, before being upthrust, pierced and isolated by the later plutonic rocks, especially porphyritic trap, once extended over the whole region; and formed dry land where sea and reefs now are. Here we see them in the whole segment of the circle, trending from El-Muwaylah through the scatter of islands to Makná, and thence to the north-eastern base of the Sinaitic peninsula. Thus the Gulf El-'Akabah, a depression probably caused by the upheaval of the igneous mountains, was in early ages a vast level plain with broken platforms of gypsum, crossing diagonally from north-west to south-east, the northern third of the great inlet. M. Marie (Report) assigns four several epochs to the coast of Midian: 1. The primary, when the earth's surface, affected by secular cooling and contraction, assumed its present shape. 2. Secondary, sulphates and carbonates of lime, gypsum, chalk, plaster of Paris, marble and alabaster, rising to a maximum (?) of 1200 feet above the surface. 3. Plutonic injections of red felsite, jasper and green porphyritic trap in solid masses and veins of all sizes cutting through the granites and syenites; and lastly, 4. The comparatively recent upheaval of the Gháts or coast ranges.

In this part of my paper I shall dwell chiefly upon the changes to be made in the Admiralty Chart (Red Sea, Sheet 1). It is incorrect to the last degree; especially upon the Sinaitic side, and its errors have extensively infected popular works. The coast line seems to have been laid down from a flying survey; of course the names are all wrong; and, worst of all, the harbours are either unmarked or wrongly marked. The naval officer, Ahmed Kaptán, who had been sent with us to take astronomical observations, unfortunately fell so ill that he was compelled to lay up. A correct survey of both coasts will be a *sine quâ non* when the mines are worked.

At 9 A.M., after a long delay in fishing up the anchor, and in persuading the rotten old boiler to work, we stood over for the Sinaitic shore, distant 13 miles (direct geog.); and we made in three hours the Marsá or M'inat el-Dahab, the "golden anchorage" or "port of gold." This name is applied by the pilots, as by Burckhardt, only to the mouth of the Wady el-Dahab, which above its gate becomes Wady el-Ghayb, draining the eastern flank of the so-called Mount Sinai. It is a shallow sag, with a central line of palms, the usual branch huts inland, and wells of brackish water: it is affected by mariners during southerly gales, because it is protected by a projection and a ledge of reef. Ruppell calls it "Minna;" he was then a sucking Arabist; but his map, all things considered,

is wonderfully correct. What the chart calls "Dahab, good anchorage, sheltered from all winds," is known to all as M'inat Ginái (جناى)\*, so called after the black mountain of porphyritic trap rising abruptly behind it. This dock is defended to seawards by a "sandy nook," a spit, curling like a shepherd's crook, that sweeps round from the east to the south-west, giving shelter to the many Sambuks which frequent it during the season when pearl-oysters are fished. All along this coast similar coralline reefs serve to build the land; they are gradually covered with conglomerate, and converted into *terra firma* by the rubbish shot and shunted from the wady mouths—a process still actively carried on.

*Feb. 4th.*—We set out northwards at 7 A.M., when an Azyab, or southerly wind, threatened a blow. After steaming two hours (= 7 knots) we landed a party at the Wady Umayyid (عميد, "of the little pillar") to inspect certain patches of whitish stone, of which a specimen had appeared above the black porphyritic gorge in the Jebel el-Ginái. Already in the Wady el-Dahab we had found water-rolled pebbles of quartz, including the crystallised and the green or copper-stained; but not the immense variety common to the Arabian side; nor could any veins be traced in the rocks. A fragment of limestone, with sharp angles, showed that its origin could not be far distant. The Bedawin, like those about the Cairene pyramids, ignore the Midianite terms "Marú" and "Marwah," † calling the rock *Súwan*, properly speaking syenite, but popularly applied to any hard stone, especially silex. Water-rolled fragments were again found in this large Wady Umayyid, which extends a whole day inland; but the white sheets, flecking the hills here and elsewhere, proved to be light-coloured chlorites and serpentines. From the mouth of the Marsá el-Dahab (proper) to the Wady Watír ("of the Hill-track"), the maritime range of Sinai is known as the Jebel el-Samghí. And now the errors of the chart amaze us. The Ras "Arser,"—what a name for a headland!—should be Ras Kusayr (قصر, the small fort, "Cosseir"); moreover, it wholly wants that safe-looking land-locked nook to its north. The reality, a trifling projection, which is passed without remark, is backed by a mere rent in the hills, a short broad Fiumara, called Umm el-Afa'í (the "Mother of Vipers"). Beyond it we passed at 12.30 P.M. (3 hours 20 minutes = 12 miles) a yellowish little buttress, the

\* From Janáa, being hunchbacked, gibbous.

† See part i. sect. ii.

Turayf el-Rîh ("Little Facer of the Wind"), and another similar bluff lump of rock, which also breaks the line. The larger of these two features is the third and southernmost projection of the western shore seen from the northern end of the Gulf.

About 2 P.M. we were abreast of the line of palms, and the deserted huts which form the southern Nuwaybi' (نويبع), meaning the little Naba' ("Spring"). Burckhardt ('Arabia,' p. 516) writes "Noweyba," without his usual accuracy. Evidently this is the place which the chart, calling it "Wasit," thrusts some 10 miles south of its single "Nawibi;" and where it shows an anchorage (⌘) of 12 fathoms, defended on the north by a projection of the coast. The water-pits and date-trees owe their being to the anastomosis of two well-defined sandy Wadys, issuing from their respective gorges, the northern and the southern Wady el-Sa'deh. The Jebel el-Sa'deh, separating the two like a wedge, shows at its seaward base blots of mauve-red overlying dead-white clay (?). They extend along the left bank of the valley to the north as far as the foothills facing the shore. These are the first indications of the Secondary formation in "Sinai"; farther north they appeared in force.

After passing the southern Nuwaybi' we doubled a long sandspit, projecting far eastward, with a line of light-azure water, showing shallows at the apex. It protects from the south a fine deep bay, which is also well sheltered from the north by several lines of shallows. The loose sands, spread over the reef, are so light and subtle that they are moved by every stray breath of wind. They film the ground, and hide the hills like a dust-storm in Sind. As usual in 'Akabah Gulf, the water is so deep that a ship may ride within a few yards of the shore.

This anchorage is called by the pilots Wásit (واسط) the "Middle"), and it occupies the southern half of the bay; the northern moiety, with its little creek and line of palms, being called the "Upper Nuwaybi'." The vegetation is fed by the large Wady Muzayrig (مزيريج),\* which vomits an exceptional

mass of arenaceous matter to the north. The chart places the anchorage (10 fathoms) south of the main projection, when it lies on the other side. Wellsted (ii. 150) imperfectly describes "Naweibi," one of his stations, as "a narrow slip of land

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\* For Muzayrij (short vowel), dim. of Mazraja, to c. form of Zarj, a tumult, noise of hor-cs



covered with date-trees. Beyond this the country rises with a gradual sandy slope to the distance of 2 miles, when it meets the lower undulations of the mountains."

About Wásit the palms are scattered, and the large sand-mounds threaten to bury them; already several are waist-deep in it. Behind the bay, and distinctly visible from the other side of the Gulf, is a great gash, the Wady Watir (وطير)\*;

by which Syrian and other Christian pilgrims to Sinai make the monastery, rounding on camels the dangerous northern third of El-'Akabah. This valley receives from the south, and distant one day's march, the Wady el-Hazrah (Hazeroth),† "the most beautiful and romantic landscape in the Desert" (Palmer). From the north it is fed by the Wady el-'Ayn, which can be reached in half a day; at least so said the guide, Mabruk ibn Sulayyim, the Muzayni, whom we had shipped at the last landing-place. I was careful to check his information concerning the coast by making general inquiries, and he was not found wanting. These valleys are imperfectly shown in the chart; better by Professor Palmer ('Desert of the Exodus'), who visited and described them.

Anchoring under the Wásit sand-heaps at 3.30 P.M. (6 hours 30 minutes=30 miles), we made certain that the "Nawibi" of the chart utterly wants the cover of the northern sandspit, which, as has been said, lies south of it. The Bedawin of all this coast are of the Muzayni tribe, a miserably poor and wretched, degraded lot. They live, like savages, on fish and shell-fish, use catamarans of untrimmed palm-trunks; drink brackish water, and sleep under the trees rather than repair the huts. Of course they are desperate beggars, as they are greedy, idle, and worthless. The two men and three women, who were waiting upon their few camels—no sheep were to be had—refused, without initiatory "bakhshish," to tell the site of certain ruins in their hills, concerning which they discoursed or romanced. Beyond Nuwaybi' to El-'Akabah there is absolutely no population on the "Sinaitic" shore.

*Feb. 5th.*—At 6.30 A.M. we stood eastwards, to avoid the

\* "A necessary" (thing): "wátirat" would mean a manner, mode or way.

† The Rev. Mr. Holland (Paper at the British Association meeting of 1878), who had walked from W. Watir to Ras Mohammed, disputes the identity of Hazeroth and W. el-Hazrah (of the "pursuer," or of "settled abodes"). He does not "believe it possible for the large host of the Israelites to have travelled this way." The same may be said of almost the whole route during the Exodus and the wanderings: on the one hand the figures (600,000 men, &c.) are amenable to a very large reduction. If two millions of souls are to travel through a desert without starvation they travel by a miracle, nothing less; and it matters nought whether the road be "possible" or not. Should reason be admitted, we reduce at once the two millions to twenty thousand.

northern reefs and shallows, which had defended us during the night, and we passed the northern Nuwaybi', the little creek to the north-west of Wásit. From this point to the Gulf-head a continuous line of shoal-water, subtending the coast, and compelling ships to stand comparatively far out, is rightly set down on the chart. Presently the western seaboard entirely changed its dull, desolate, monotonous aspect. The view became essentially "Sinaitic," and unlike anything I had seen, save and except only Iceland—to compare two extremes that attempt to meet. The eye rests upon a screen showing one or more planes of bare and barren rocky walls and peaks, dun-brown and light-yellow, contrasting strongly with the bright blue sea. Its charms are not those of the horizonless golden Desert; of the fertile valley, of the fair field. Neither stream nor forest diversifies it: "The tints are those of sunlight on the coloured stones, and the outlines are the contours of the rocks." In the lowlands, and forming small sea-facing bluffs, gleam rainbow hues, red and yellow, mauve, purple and dull-white clays, the Brazilian Tauá; while inland, parallel with the shore, and peering above the granites, the syenites, and the porphyries of the coast, rise the pale forms of the "Sinaitic" Shafah, the "Lip Mountains." The name, unknown to the chart, is given to that section of the Eastern ("Sinaitic") Gháts which, beginning at Wady Watír, passing the Jibál el-Samghi northwards to the Hajj-road, and even beyond El-'Akabah. The naked, squalid, ghastly hues, and the peculiar quoin-shapes, at once disclosed the familiar Secondary formation of Midianitish Makná. The guide called this gypsum by its Arabian name, *Rughám*,\* in opposition to *El-Hazb*, the sandstones. The latter word is explained further on. I was not surprised when shown a Jebel el-Kibrít, a taller form than its neighbours. It is probable that the brimstone deposits, like the copper silicate and the turquoises of Ziba, rounding the head of El-'Akabah, run down the Arabian shore parallel with the African seaboard.

After 1 hour (=  $3\frac{1}{2}$  knots) we passed the unimportant Ras el-Málihah ("Salt-head"), sheltering to the north a little creek, and forming the southern buttress of a short, broad valley; up the latter, after an hour's walk, palms and a well of brackish water are said to be found. This is probably the "Amhaid," a name unknown to the pilots, which the chart places some five miles north of its "Nawibi." At 9 A.M., after 2 hours 50 minutes from Wásit (=  $9\frac{1}{2}$  knots by dead reckoning), we passed Ras el-Ramlah, the "Sand-head" (not *Abu Ramleh*), a ruddy-

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\* *Raghám* in classic Arabic means soft soil mixed with sand; *Rukhám* is the mucus of sheep.

faced bluff with a cravat of loose drift, covering the neck and making this second great projection from the western shore equally conspicuous from the north, the south, and the western sides. Behind it lies the Wady Suwayr, which leads directly up to the Sulphur Mountain.

Beyond the Sand-head the "Sinaitic" flank shows a novel formation, the hills of Abú Moghrá (مغرا).<sup>\*</sup> The word in

Egypt means a ruddy or ochre colour; it is especially applied to the horizontal bands of red paint which alternate with white circles in the mosques and minarets of older Cairo—survivals of the brick courses still used to bind the stones. Abú Moghrá is a wall of broken crests, red as tiles, and looking as if built up. Guide Mabruk compared this "Hazb" † with the Hismá rocks, which are nothing but New Red Sandstone. A tall quoin of gypseous matter shows where the Egyptian Hajj-caravan, after rounding on return the northern end of the gulf, nights at the 'Akabat el-Misriyyeh or Egyptian steep. This gap in the western wall of the Wady el-'Arabah is so called to distinguish it from the 'Akabat el-Shámiyyeh (Syrian steep), a similar formation on the Damascus-Medinah road, 60 miles farther east, described by Burckhardt (Appendix III. 'Travels in Arabia,' "The Hadj-route from Damascus to Mekka"). The Nakb or Pass used to be dreaded by camel-riders before it was repaired by Abbás Pasha. The Princess-mother of the first Khediv was the traditional "Pasha" who first made the pilgrimage in a carriage; but, according to accounts, the vehicle in many places was carried upon men's shoulders. ‡ The Bedawin deny that the town 'Akabat-Aylah (Elath) and the Gulf el-'Akabah take their name from this feature: the words mean, they say, that the Red Sea "heels" (Ya'kkab el-Bahr), that is, comes to an end.

Ahead of us, on the western coast, we saw upon the chart exactly what is *not* in nature. The northern horizon, by no means a straight and almost unbroken line, is bounded by a long white gypseous projection, the Ras el-Tabahah, which some call Tábakah and others Tábah. It completely hides the Gulf-

<sup>\*</sup> From Maghar, a dark opaque reddish colour.

† In classical Arabic *Hazb* (هَضْب) would be the plural of Hazbat, a range of mountains or hills, a high steep, isolated ridge or cone, or a large projecting rock. Here it seems to be applied to the red and ruddy sandstones. Huzaybat (Hudaybat, the diminutive form) means a "hillock" in "Sinai" as well as in Midian.

‡ A careful description of the line is given in Dr. Beke's return journey from "Sinai in Arabia." The veteran traveller and his companion, however, paid no attention to the antiquities on either side of them, and they passed by *El-Hardwit* ("The Ruins") without even inquiring the meaning of the word.

head; and to the south of it projects a smaller point, also white and gypseous, known as El-Tuwaybah, the "little Tábah." There was scanty sign of the "White Cape," which on the chart is no cape at all, except a brown headland—perhaps it may gleam bright in the sun—forming a shallow bay, bounded north of the Ras el-Tabehah. 'Akabah town now appears off the star-board bow in the usual shape of a long line of palms. The guide gave the name Jebel and Wady Umm el-Hayyah ("Mother of the Snake") to a heap and a watercourse on the left shore. At 11.30 we steamed by the Wady El-Mukabbilah (مقابلة), whose broad shunt is literally garnished with thorn-trees, and whose Ras or headland forms the first great projection of the western coast as viewed from the northern Gulf-end.

At 12.30 P.M. (6 hours =  $22\frac{1}{2}$  knots) we anchored in the deep, narrow channel separating the "Sinaitic" mainland from the northern one of the two islands in the 'Akabah Gulf. Strange to say, neither of them appears in Keith Johnston's folio. This scrap of rock is known to the maps as Jezírat Fara'un, possibly from Senaferu of the First Dynasty, who conquered Mafká-land—the Country of the Turquoise—or "Sinai"; and the moderns still preserve the Pharaonic tradition. The vulgar term is Jebel el-Kala'h, "Fort-hill;" Burckhardt ('Arabia,' p. 511) calls it Koreye; Schubert, Kurayyah; and Arconati, Jezirat el-Qoreieh, evidently all corruptions of Kala'h. Schubert also would here place mysterious Eziongeber. Rüppell, who first visited El-'Akabah town, which many others, Burckhardt included, had failed to reach, gives "Emrag," doubtless for Marákh, the name of a large Fiumara on the western mainland, lying a short distance to the south. Beke (p. 359) has a fair sketch of his "Jesirat Fir'on," and quotes the Sailing Directions, which here may be trusted. I need not repeat my long description of this lump of granite and its Moslemised Crusading castle; the latter possibly built upon older foundations.\*

*Feb. 6.*—A day occupied in tinkering our tubes, and in surveying the castle, which is much more ruinous than when sketched by Rüppell in 1822. Wellsted's short description ('Arabia,' vol. ii. chap. ix.) is still correct, as it was in 1838.

*Feb. 7.*—We got up steam at 9.15 A.M. without an accident—very unusual! Running up the deep, narrow channel, which must be an excellent harbour of refuge in the wildest weather, we rounded the northern end of the islet-rock. On the shore to port were the Tuwaybah and the Tabehah Points; the latter is faced by Daum-palms, and up its bed are said to be water and

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\* See 'The Land of Midian (Revisited),' chap. vii.

date-clumps. Then came the broad mouth of the Wady el-Misri (Egyptian valley), at whose head is the Nakb el-'Akabah. This is the Wady el-Musry of the chart, which Beke (p. 460) has called the Wady el-Maháserat—meaning of “hemming in,” or “driving into a corner” (p. 491). In its limestone holes he found reason to identify it with the Exodical station Pi-ha-hiroth, or “entrance to the caverns.” We thence struck across the Gulf-end, and at 10.50 A.M. (= 1 hour 35 minutes = 7 miles), we anchored in twelve fathoms water off the Fort el 'Akabah.

Mr. John Milne, F.G.S. (p. 537, Geological Notes, &c., Appendix to Dr. Beke's 'Sinai in Arabia'), has the following remarks upon the subject of a canal between 'Akabah and the Dead Sea. “Should this ancient Gulf be restored (which would apparently be an engineering work far less difficult than the recently-constructed trench between Suez and Port Said), Jerusalem, Damascus (?), and other Syrian towns would again be in communication with the Indian Ocean, and fleets like those of Solomon (!) might ply up and down the now entirely deserted Gulf of Akaba.” Does this savant reflect that he simply proposes to swamp the whole lower Jordan? to bring Tiberias and its lake about 620 feet below the sea surface? in fact to overwhelm half the “Holy Land” in a nineteenth-century deluge?

The rest of the day was passed in receiving visits from the officials, including Mohammed bin Jád el-'Alawi (of the 'Alawiyyín-Huwaytát) who styles himself “Shaykh of El-'Akabah,” and whose tribe is recognised as the lawful owners of the land upon which Sultán Selím Khán el-Fátih (the Conqueror) built his fort. Under his guidance we landed at the mouth of the bay, where ruins still show the site of ancient Elath, the port of the Nabathæan capital, Petra, distant up the Wady el-'Arabah only two days of dromedary-riding. The people declare that the old city extended all round the Gulf-head from north-west to north-east, where the modern settlement lies. Linant and Laborde ('Voyage de l'Arabie Pétrée, &c., Paris, 1830) confine it to the western shore, and, like Schubert, place Eziongeber facing it. Amongst the tumuli we found scorix, old and new, showing that metal was also worked here; and a fine specimen of “Mafká” or copper-silicate from the “Sinaitic” Wady Raddádi (ردادی) suggests the kind of ore treated by the Mutakaddimín, or “Men of Old.”

And now to tell the tale of the “true Mount Sinai.” On the eastern shore of the gulf, south of the town, the two-fold chain “Jebel el-Sharaf,” under whose jagged crests the Hajj-Caravan wends its painful way to avoid the mountains Tayyib Ism and

El-Mazhafeh, that sit with their feet in the sea, sweeps round from S.S.E. to N.N.W. and coalesces into a single range. This line, the Jibál el-Shará' (شراع), the Mount Seir (the

Rugged) of Hebrew Writ, trending northwards, presently becomes the huge eastern wall of the Wady el-'Arabah. A little beyond El-'Akabah, and draining through the settlement, is the Wady el-Yitm (يتم), a corruption of "Yatm" or "Yutm"

(solitude, orphanage, separation), which allows easy access to the Hismá. Burckhardt, usually so correct in his names, first miscalled it (وادی اثم) "Ithm" ('Arabia,' p. 511), and

described it as "leading eastwards towards Nedged." Wallin, as will appear further on, preferred "Wâdî Lithm," another evident error. Its right-hand buttress, the Jebel el-Yitm, forms the apex of this part of the chain. It is a remarkable feature, not only for its height, commanding, they say, a view of Mounts Tor ("Sinai") and Hor (Aaron's tomb), but also for its threefold finial of domes and pinnacles. Hence the Bedawin, who always attach some modern legend to places which strike the eye, climb it at certain times and make sacrifice at the tomb of an obscure santón, Shaykh Bákír ("who rises betimes").

"Hither," said Mohammed bin Jád, "came an old man and a young man, in a steamer belonging to H.M. the Khediv. The former told the Arabs that in his books the Jebel el-Yitm was called in his books the Jebel el-Núr, or the Mountain of Light, and the latter climbed to the mountain-top. After which they posted away."

I quite agree with my lamented friend, Dr. Beke, that we have still to find the "true Mount Sinai." If anything of the kind exists, it is probably some mount or hill in the Negeb (Negeb), the south country of the days of Abraham or still farther south, near the base of the Sinaitic Peninsula, the desert called, by moderns, after the "Wanderings."\* The profoundest Egyptologist of our day, Dr. Heinrich Brugsch-Bey, observes that the recognised site lies south of, and far from the line taken by the Bene Israel; and that the papyri show no regular route leading anywhere in that direction. Many, also, have remarked that the Sinai of the Exodus is a single isolated mountain or hill, not one projection from a long range of heights. I would further suggest that the best proof of how empirical is the present identification will be found in the fact that neither the old Israelites nor the modern Jews have ever visited, or

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\* See note at the end of this section.

now make pilgrimage to, the spot which ought to be one of their holiest of "Holy Places." It is evident that Jebel Serbál dates its honours only from the earlier ages of Koptic Christianity (fourth century); whilst its Greek rival Jebel Músá, the mountain of Moses (the Bishop?) is even younger. The appeal to tradition must be vain when the order of succession and "migration of holy places" is: 1. J. Serbál (Copts, Burckhardt, Lepsius); 2. J. Músá (Greeks, Helena, Justinian); 3. J. Katérina (Rüppell 19th century); 4. J. Safsáfah (Robinson, ditto). The Great Law-giver probably marched his few *familie* of fugitive slaves over the plains of El-Tih north of the so-called Sinai, and up Wady Yitm to the Nejob or south country, in small divisions like those of a modern Bedawi tribe; and we know from the latest surveys that the land, now a fiery and frozen wilderness, was once comparatively well supplied with wood and water. Dr. Beke is right in denying that the "Mountain of the Law" is the site at present chosen for it, but I cannot believe that he has found it in the Jebel el-Yitm near 'Akabah.

A few words concerning this Yitm, Wallin's "Wádi Lithm."\* He makes it a cross valley opening through the maritime chain at about 8 hours=24 miles, north of El-'Akabah: the mouth is hardly a mile north of the fort, and the distance to the head in the Hismá is two short stages. He is right in stating that the mountain-range from the Yitm to Syria, forming the eastern wall of the valley El-'Arabah, is universally known as the Jebel El-Shará; the Sa'ar of the hieroglyphs and the Mount Seir of the Hebrews. But he is wrong in supposing (p. 306) the coast lowlands of Madyan Proper (north Midian) to be "known by no other name than that of El-Sáhil," the shore. All the Bedawin use the term "Tihámat Madyan." The former word means a country enclosed by mountains, and generally with an unhealthy and oppressive climate; while Tähmäh, in these lands at least, is a modification confined to the Ma'ázah tribe. In the Kámús, of Firozábádí (nat. A.D. 1328, ob. A.D. 1414), "Tahmá" or "Tähmäh" is translated "land sloping towards the sea," opposed to "Tihámah," or lowland in general. The word therefore is classical, and Wallin seems not to know that when the Bedawi of Táif told him the inhabitants call "Tihámah" what other Arabs call "Hijáz" the informant alluded to the "Tihámat el-Hejaz," or maritime lowland of the Hejaz.

El Madáini informs us that the whole mountain-chain, extending from Yemen along the Red Sea to Syria, in fact the western Gháts of Arabia, is called El-Hejaz. The term adopted

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\* See 'Journal Royal Géographique Société', vol. xx. 1870, pp. 302-306.

by Golius (Notæ, p. 98); by Niebuhr (Description, &c., p. 160); and by Caussin de Perceval (*Essai sur l'Histoire, &c.*); is utterly unknown to modern Arab usage. Similarly Ibn Ayás names the range "El-Sherá" through its whole extent. Wallin may be right in making the eastern boundary of El-Hejaz a line drawn from Táif, *viâ* El-Medinah, to El-Hijr (or rather the Wady Hamz); but he is wrong, at least regarding present custom, to exclude from it the two first-named towns. Again he is mistaken when he asserts "if the line be continued northwards from El-Hijaz, along the course of the eastern parts of the Shefah chain as far as Wâdî Lithm (Yitm), it will mark the eastern limit of the land to which the Bedawin now give the name of El-Tāhāmāh." The Bedawin draw the line carefully between the Shafah and the maritime range; and thus the sequel from the Coast eastward would be:—

1. El-Sáhil, or El-Tihámah, the coast plain.
2. Jibál el-Tihámah, the "Ghâts."
3. El-Shafah, bounding the Tihámah to the east.
4. El-Hismá, the elevated strip of sandstone plain.
5. El-Harrah, the line of plutonic action.

Finally Wallin is quite right when he asserts that El-Hejaz, El-Tihámah and El-Shará "were originally specific names for different parts of this region, and that they have been extended by different authors to the whole of it."

Whilst we examined the Fort, Mr. Clarke and Ali Marie busied themselves with buying up such stores as El-'Akabah contains. I also made arrangements for a dromedary-post, and wrote officially to Prince Husayn requesting that H.H. would exchange the *Mukhbir* for a steamer less likely to drown herself. Moreover the delay at Magháir Shu'ayb had exhausted our resources; and the Expedition urgently wanted a month's additional rations for men and beasts. The application was, it will be seen, granted in the most gracious manner; and the orders were carried out with as little delay as possible. Messrs. Voltéra Brothers were also punctual and satisfactory in forwarding another instalment of necessaries and comforts. For this postal service and by way of propitiatory gifts Shaykh Mohammed received \$10, of which \$2 were probably disbursed; consequently we parted fast friends, he giving me an especial invitation to his house in the Hismá, and I accepting it with the firm intention of visiting him as soon as can be managed. The officials of the Fort, who stayed with us to the last, were profuse in kind expressions; and in little gifts which, as usual, cost us double their worth.

I now resolved upon hastening back, with all speed, to El-



Muwaylah, finishing by the way our hitherto successful task of quartz-prospecting on the 'Akabah Gulf. We had already twice been prevented by circumstances from visiting the Hismá, and I was determined to devote all our energies to the exploration.

*Feb. 8th.*—The morning was cloudy, misty, rainy: to the north-west and south-west we saw—rare thing in arid Arabia—two rainbows at one time. We set off, at 7.30 A.M., along the mountain-wall of El-Shará, which, after about three miles, trends away to the south-east; thus differing from the Sinaitic side where the rock-curtain hugs the shore. The interval is a broad and sandy slope, here and there streaked with dark ridges extending from the Gulf to the highlands. For the “elevated stony plain gradually rising from the sea” of the chart, read—“sandy ledge and occasional outcrops of rock, cut by a network of huge Wadys which unite near the shore, declining from the Jebel el-Shará, and from those of El-Tihámah.” Evidently the highlands are primitive, but a white and purple patch seen from afar suggests a remnant of the Secondary.

After 2 hours 45 minutes, steaming at the rate of  $4\frac{1}{2}$  knots an hour, we ran (10.30 A.M.) into the fine-looking but open and treacherous bay of Hagoul (Hakl حقل),\* 13 direct geographical miles from El-'Akabah. This is the 'Αγκάλη, which Ptolemy (vi. 7. 2) places amongst his *oppida mediterranea*, in N. lat.  $28^{\circ} 45'$  (true  $29^{\circ} 13'$ ), between Madiáma (Μαδιαμα) or Magháir Shu'ayb, in N. lat.  $28^{\circ} 15'$  (true  $28^{\circ} 28'$ ), and Mákná, the modern Makná or Madyan, in  $38^{\circ} 45'$  (true  $28^{\circ} 24'$ ). We had heard of ruins in this place, and a “written stone” to the south; but we could hardly expect anything more interesting than at El-'Akabah; and the *Mukhbir* was so handled that she appeared to have every chance of scraping acquaintance with the reefs and shores. I therefore ordered the Sambúk to touch at Makná, and to embark the specimens left by Lieut. Yusuf on the shore; whilst the steamer continued her voyage southward.

The Arabian coast-line is here simpler than that of Sinai, and, consequently, the chart had a better chance in all things “barring” philology. A rounded projection separates El-Hakl from the Marsá el-Humayzah (حمضة), so called from a grass eaten by animals, and not to be confounded with Humayz (حميز), the Egyptian form of Hummáz (حماض), wild sorrel. It is entitled El-Kabír (the Great), in order to dis-

\* In Arabic the word means rich arable land, or tilling the land—hence the corrupted Greek “Ancále.”

tinguish it from another feature to the south. The broad mouth of the Wady shows two lines of palms, one near the right bank, and the other in the middle, where the frond-huts stand. After  $6\frac{1}{2}$  miles from El-Hakl, and nearly 20 from El-'Akabah, we steamed along the islet El-Humayzah, which the surveyors have abominably perverted to "Omeider:" from it the Ras el-Ramlah bears  $273^{\circ}$  (mag.).

South of the islet, and separated by a point of yellow sand, is an extensive inlet, the Ghabbat Humayzah: it is not on the chart, although Wellsted (ii. 138) speaks of the "capacious bay of Goobut Homaïdah." The black trap hills of the shore here form a broken circle, which, on the up-voyage, we had taken for a volcanic crater; and the valleys of the Arabian interior seemed from the ship to run  $110^{\circ}$  (mag.); \* whilst those of Sinai trend to  $150^{\circ}$ . Beyond this outbreak, again, two wady-mouths form shelters for native craft; and innumerable dry Fiumaras meet and intertwine, dotting the sand with shrubs, whilst a mass of reefs outlies the shore. By day this *Sahîl* ("shore-tract") is dry, dusty, and glaring enough; only for a few minutes at even-tide it becomes a beautiful spectacle, an enchanted scene, when the setting sun stripes it with broad bars of purple and gold. Farther south, as we approach the place of the Bir el-Máshî ("Well of the Walker"), where a desert-track leads to the Wady Marshá, the hills become smaller, and, approaching the sea, directly discharge into it their rubbish. The next feature is the grand *massif*, the Jebel el-Mazhafeh, whose length is apparently disposed perpendicular to the coast-line. Its five blocks, becoming taller and larger as they run inland, culminate in a topmost pinnacle to the east: the lower cliffs fall clear into the sea, forming quaint black gorges and ugly caverns, like those which break the precipices of the Northern Ocean.

We passed an ugly night, our third since leaving Suez, and, of these, two were, under the circumstances, really risky. At 4 P.M., the norther again began to show its nasty temper, and, about an hour afterwards, the speed was reduced from  $4\frac{1}{2}$  to 3 knots, lest we should reach the Bugház, or Straits of the 'Akabah Gulf, before dawn. At 7.30 P.M., we could see, under a moon approaching her first quarter, the *Suwayhil* ("Little Shore"), and its anchorage-ground, in the sand-tract vomited by the Wady that divides Tayyib Ism from El-Mazhafeh. Finally about midnight it was necessary to turn the gun-boat's head northwards, in order to ride out the furious gale.

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\* Some of the guides hereabouts mentioned a certain Jebel el-'Inab ("Mountain of Grapes"), but we could not lay down its site.

*Feb. 9th.*—Despite the stormy weather, we passed safely out of the 'Akabah gate, and anchored under the southern side of the Tírán Island.

*Feb. 10th.*—We examined Tírán Island: a very curious formation.\*

*Feb. 11th.*—After the narrowest possible escape from shipwreck, we ran into the fine natural harbour of Sináfir Island.

*Feb. 12th.*—The gale continuing, we stuck to Sináfir.

*Feb. 13th.*—We ran from Sináfir to El-Muwaylah, 50 knots, and 5 to 6 more to our old anchorage, the Sharm Yabárr, a total of 10 hrs. Concerning these five days nothing more need be said; the events were personal; my little geography was done, and the return is described, at full length, in my last volume.

Our journey through North Midian (Madyan Proper) had lasted 54 days (December 19, 1877, and February 13, 1878). During nearly two months the Expedition had covered only 106 miles of ground; this, however, does not include the various by-trips made by the members, which would more than double the total, nor the cruise round the villainous *Meer-busen* of 'Akabah. The number of camels varied from 104 to 60, and the total hire, including "bakhshish," amounted, according to Mr. C. Clarke, our managing man, to a total of 316*l.* 14*s.* 3*d.*

#### NOTE ON THE "TRUE MOUNT SINAI."

After these pages were written, I read extracts from an interesting paper published in the Jewish *Monatschrift* for August 1878. Dr. Graetz, the author, has attempted to determine the site of Sinai and Horeb by arguments partly Biblical and partly topographical. He observes that the texts (Deut. xxxiii. 2; Judges v. 4-5; and Habak. iii. 3) distinctly point to Seir, or Edom, rather than to the peninsula now called Sinai; also that the first of the stations after leaving "Mount Sinai" was the wilderness of Paran, in which lay Kadesh (Deut. xxxiii. 2). The Hebrews, when asking leave of the Pharaoh to go and worship their God, specified three days as the length of the journey. Dr. Graetz fixes the "Mountain of Law" on Jebel 'Aráif, "which out-tops all the other mountains of the neighbourhood: it is surrounded by table-land, and there are traces of the fenced inclosures of a primitive people, probably the Amalekites" (Palmer). No wells were found, so that the Israelites at the neighbouring Rephidim might easily suffer from thirst. In Judges v. the poet speaks of Sinai as if it were known—"This" (or yonder) "Sinai." The prophet

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\* See 'The Land of Midian (Revisited),' chap. viii.

Elijah also is represented as readily reaching it from Beersheba and Kadesh. Dr. Graetz makes the Yamm Sûf (Sea of Weeds or papyri), not Sirbonis (Brugsch), nor 'Akabah (Beke), but the Timsah water or the Bitter Lakes, in early ages the undoubted head of the Gulf of Suez; and thus his Exodus would lie to the N.N.E. of Egypt. The whole paper should be read, as the author ingeniously accounts for the topographical errors of Biblical students which have lasted for so many generations. The subject has been exhaustively treated in 'The Hebrew Migration from Egypt' (London, Trübner, 1879). A good result to be expected from these various opinions is that presently "Mount Sinai" will disappear into that region of myths, the land of Meru and Olympus and Meröe, from which it emerged during the first centuries following the rise of Christianity.

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## PART II.

### *The March through Eastern or Central Midian.*

I. *Work in and around El-Muwaylah.*—At El-Muwaylah, where the Expedition found itself once more united, I lost no time in receiving the reports of Lieut. Yusuf, M. Philipin and Shaykh Furrayj, concerning the southern Jebel el-Kibrît, and their march from Makná. Their details of the Sulphur Hill are not worth chronicling, but the itinerary is.

About 8 A.M. (Feb. 6) the camp set out from the old town of "Madyan," with all the Shaykhs whose presence was officially required by the Hajj-caravan at the Fort. A total of 34 camels was charged for, if not employed. The line led up the Wady Makná, before described, and presently struck the Wady Mu'aytan (معيطان) between the Jebel el-Mab'ûg east, and the Fahísât Rock on the other side. In the flanks of the latter, as has been said, they found fine micaceous iron, and two deposits of green "marû," showing copper. The quartz, indeed, lasted the whole way to the *Soufrière*; and hills of white gypsum were seen all along the road. After a total of 2½ miles they struck the great Wady el-Kharaj, before mentioned as bounding the Fahísât block to the east. At 9.17 A.M., after a total of 3½ miles, they left it on the north, and turned into a branch, the Bark el-Jemel (برق الجمل), or "Surprise of the Camel." A few minutes more led them to the Wady and Jebel el-Rîsh, *alii* Rishab ("of the Feather," here not an unusual

name): it is a collection of various-coloured hillocks described as plutonic, rising out of the Secondaries: possibly it may be as rich as the Fahísát. After 1 hour ( $= 2\frac{1}{2}$  miles) up the Rísh valley, they left the caravan to take the direct road to 'Aynúnah, ascended the Wady Musayr (مصر), and again turned off into a branch Sha'b, or Nakb. This ugly, narrow pass placed them at their destination about 1.30 P.M., having travelled 4 hours 20 minutes ( $= 9$  miles).

They ascended the hill after tethering their animals so badly that Furayj's dromedary broke loose, and M. Philipin's mule at once followed its example. Specimens were hurriedly collected, and the inspection lasted only ten minutes. They then left the place at 2 P.M., and hastened to follow the caravan, fearing not to catch it before nightfall. Pursuing their way up the Wady Musayr, whose head was reached in an hour, they crossed a broad Fiumara, the Wady el-Wagab (وغب), running south-west to the sea. Then passing over

to Wady Nakhil, and other beds, they camped at 6 P.M. in the Wady Abú Zufrah ("of the Zafrah plant" = *Iphiaona scabra*).

On the next day (Feb. 7) they fell into the Wady Jiyál (جبال, that is, "of Circumambulating"), a kind of sink, whose palm-grounds extend about a quarter of a mile, and whose wells and rain-pools are too brackish to drink.  $11\frac{1}{2}$  miles distant from 'Aynúnah, it looks from that station like a long, thin tongue of sand. This is the *Brunnen el-Gear*, which Rüppell (p. 231) places 4 *stunde* s.s.w. of his *Thal Beden*. Thence they passed into the Wady 'Afál, whose acquaintance we had made at Magháir Shu'ayb; and, after marching over a low, sandy, and nullah-cut maritime plain, they struck the Hajj road. 'Aynúnah was made in 4 hours 40 minutes, a total of 9 hours from Makná. The general direction of the march lay to the s.s.e., and the Sulphur Hill was to the west of it.

This work was very carelessly done. Ten minutes do not suffice for a detailed plan. Moreover, I learned nothing concerning the extent of the deposit; the existence of wood and water; the distance from the coast; and the best harbour of export. I also wanted specimens from the Jebel el-Fayríz, the so-called turquoise-hill, to which a flying visit had been made by Commander Ahmed during our northern march; so Lieut. Yusuf was again sent northwards, with orders to bring home carefully-drawn maps, plans, and sketches. His party, consisting of three soldiers, three quarrymen, an Arab guide, Jázi, and eight camels, left El-Muwaylah early on Feb. 18,

and in 11 hours reached the Jebel el-Fara', or northern "Turquoise"-hill of the Arabs. He there passed a day, sprang two mines, made a plan of the diggings, and generally confirmed the report of Ahmed Kaptán, except that no signs of work were found. These veinlets, scattered at uncertain intervals in the rock, confirm the idea that the material is silicate of copper, certainly very rich, as some specimens, when tested, yielded 40 per cent.; but probably limited in extent. Finally, two camel-loads (four sacks) of the malachite-like rock were sent under the charge of a soldier to the Fort el-Muwaylah. It is possibly the "Smaragdus Cyprius" which Theophrastus mentions as being found in the copper-mines of our latest acquisition, Cyprus.

On the next day (Feb. 21) Lieut. Yusuf struck the Wady 'Aynúnah after  $2\frac{1}{2}$  miles; and, turning to the left, or west, of a straight line drawn thence to Makná, entered a country new to travellers. Leaving to the right the Wady Mukhassab (مخصب), and its Hamírah or red hill, he crossed the plain subtending the seaboard, here a succession of broad watercourses, the Wadys El-Huraybah (هريبه), "of the little War," Dakk el-'Erin (دق العرن), the "Pounding of cooked Meat," and Abú Kusaybah (قصيه), "of the Reedlet." He found the great Wady 'Afál disemboing into a portlet, the M'inat el-'Ayánát (عيانات), "of springs," useful to Sambuks; it has a sickle-shaped natural breakwater like that of Sinaitic Marsá Ginai, curving from west to south, and resembling the curious features so common on the north-western coast of Iceland. He then crossed the Wadys Giyál (Jiyál), before described, the Zaramah (زرمه), "of the Lavender," the Abú Zufrah (ظفرو), "of the Iphiona," and the 'Ishsh; nighting at the latter after a march of 7 hours 40 minutes (= 23 miles).

On the next day (Feb. 27) the travellers, starting early, crossed the Wadys Sanám (سنام) el-Hamar, and Wagab (Wajb), about which is the oft-mentioned *Khabt* or grazing-ground. From the last-named watercourse they entered a defile, devious, barren and rocky; the difficulties of the camels, however, lasted only for about 10 minutes, and the impediments were easily removed by the soldiers and the miners. An hour of this pass placed him at the Jebel el-Kibrít after a

march of 5 hours 35 minutes ( $= 16\frac{3}{4}$  miles). The total distance from 'Aynúnah was thus  $39\frac{3}{4}$  miles in 11 hours 15 minutes, which appears to me excessive.

Lieut. Yusuf's two journals, checking each other, his survey and his specimens enable me to describe this *Soufrière* with more or less accuracy. The hill is a long oval of 440 yards (east-west) by a maximum of 200 (north-south): the first plan gave it a diameter of only 130-160 yards. It extends, however, branches in all directions; the mineral was also found in a rounded *piton*, a knob in the Wady Musayr attached to the north-eastern side. The flattened dome is 50-60 feet high, and the *piton* 140. The metal, underlying a dark crust, 5 or 6 inches thick, appears like regular crystals and amorphous fragments of pure brimstone in the chalky sulphate of lime. This gypsum was ascertained to extend all over the adjacent hills; and the important point, which now remains for determination, is whether sulphur-veins can be found diffused throughout this non-plutonic formation. No blasting was here required; the soft rocks yielded readily to the pick.

Lieut. Yusuf fixed his position by climbing the adjacent hills. Thence Sináfir\* bore  $190^\circ$ , and Shu'shu'\*  $150^\circ$  (both magnetic). Greater elevations to the west shut out the view of lofty Tíran, and even of the Sinaitic range; but he had reason to think that the sea-shore to the south lay at a distance of only 3-4 miles (geographical). The nearest water reported to be in the Wady el-Nakhil to the north-east, was at 2 hours' march ( $= 5$  miles) with loaded camels.

On Feb. 23 the party set out for the M'inat Hamdán (حمدان), lying between Makná and Dabbah: the distance is 9 miles; and 35 minutes were occupied in threading an ugly rocky pass. The cove is a port for Sambúks; defended, like the roadstead of "Madyan-town," by high ground to the north. Thence the road led southwards along the shore for 1 hour 5 minutes ( $= 3\frac{1}{2}$  miles) to Sharm Dabbah, the "Sharm Dhaba, good anchorage," of the chart. Possibly one of the many excellent ports mentioned by Procopius,† it is now barren and broken by masses of reefs and shoals. The head receives the Wady Sha'ab el-Gánn (جان), "Watercourse of the Ravine of the Jinns," flowing from a haunted hill of red stone, near which no Arab dares to sleep. From that point the travel-

\* In Arabic "Sináfir" would be "pure" or "unmixed"; but I prefer referring the name to Pharaoh Senoferu. Shu'shu' is apparently corrupted from Sha'sha, the "long (island)."

† See vol. i. p. 323.

lers struck south-east for  $9\frac{1}{2}$  miles to Ghubbat Suwayhil, the "Gulf of the little Shore." This roadstead, also useful only to small native craft, lies eastward of the long point, Ras Shaykh Hamid, the "Ras Fartak" of the chart, which forms the Arabian staple of the 'Akabah "gate," and where the coast-line of north Midian bends at a right angle eastward. Adjoining it to the east, and separated by a long thin spit, is the Ghubbat el-Wagab (Wajb), the mouth of a watercourse similarly named: it is also known to the Katirah, or smaller vessels, and about a mile up its bed, which comes from the north-east, there is a well of potable water (?). According to Jázi, the guide, this "ghubbat," distant only 4-5 hours of slow marching from the Sulphur Hill, would be the properest place for shipping produce. Such details will prove useful when the sulphur-mines of north Midian shall be ripe for working.

From the Ghubbat el-Wagab the track, easy travelling over flat ground, strikes to the north-east; and, after  $14\frac{1}{2}$  miles, joins the 'Aynúnah Sultáni or highway. On February 26th, at the end of nine days' work, Lieut. Yusuf returned to El-Muwaylah with two sacks of sulphur-bearing chalk, justifying his former report. As will appear, the main body of the Expedition was still travelling through the interior. Having halted for rest at El-Muwaylah, he rejoined us on the route from Zibá; and I again found occupation for him.

At the Sharm Yáharr, immediately upon our happy return (February 13th), preparations began for a march to the Hismá. This word, which will often recur, in pure Arabic ends with "Ya-alif," and means a plain in the desert whose mountains are rarely free from dust. The Shaykhs and the camel-men, however, dreading a rough reception from their hereditary foes, the Beni Ma'ázah, threw in my way a variety of small obstacles, which were not removed without time and trouble. Meanwhile we carefully examined our harbour of refuge. In its northern feeder the Wady el-Hárr ("hot Water-course"), of which possibly Yáharr is a corruption, we were shown some fine specimens of oligistic iron and admirably treated modern (?) slags: evidently some gypsy-like *atelier* must once have worked here. The obsidian also has apparently been subjected to artificial heat; and a splinter of it contains a *paillette* of free copper. Two beds of oysters were discovered; and, armed with this knowledge, we afterwards found them in every bay. A small collection has been thrown by my gallant and lamented friend the late Admiral McKillop (Pasha) into the port of Alexandria, where, let us hope, they will become the parents of a fine large family of "natives."

I now applied myself to working the central Jebel el-Kibrít,



which had been superficially explored by the first Khedivial Expedition. The shortest cut from the "dock-harbour" lies up the southern Wady Hárr. An important divide separates

it from the Wady Jemayyis (جميس),\* over which winds the broad track of the Pilgrim-caravan. This watercourse ends, like most of its neighbours, in a reef-barred creek of lapis-lazuli coloured sea-water. Thence the track fell into the Wady Khirgeh (خرجه), where we found large blocks of the hydrous silicate, a serpentine coloured deep olive-green. It passed forward into the Wady el-Bayzá ("White Nullah"), which turns abruptly westward, and enters a second reef-closed bight: this valley was gay with the light-green foliage of the 'Arák; and already tender flowerets were beginning to sprout from the sands. Lastly, after 1 hour 15 minutes of sharp walking, we entered the broad Wady el-Kibrít, which comes from the south-east, and whose bed supplies drinkable water at no great distance. It rounds the Sulphur Hill to the south-east; and feeds the Wady el-Jibbah, itself a feeder of the Sharm Jibbah. In my first volume I erroneously wrote "Jubbah," like the "Joobbah" of the chart.

This central "Sulphur Hill" is an isolated knob rising abruptly from wady-ground; measuring in height some 240 feet (aneroid below, 30·14, and on top, 29·90); and about 960 yards in diameter, not including a tail of four vertebræ which sets off from north-west to south-east. Viewed from the north, it is, as the Egyptian officers remarked, a regular *Haram* (Pyramid), with a uniform capping of precipitous rock. It differs essentially from the other two deposits, the northern near Makná, and the southern near El-Wijh, in being plutonic and not sedimentary; and yet there is a mound of gypsum to the south-east. The altered condition of the granite, the greenstones and other adjacent rocks, suggests that it may be an igneous vein thrown westward by the great volcanic line, El-Harrah. In parts it is a conglomerate, where a quantity of quartz takes the place of chalk and plaster. Other deposits are iron-stained, and have the appearance of decomposed iron pyrites, an ore which abounds in the neighbourhood. Usually the yield wears the normal brimstone-yellow; yet some of the beds show the deep ochreous red, so common in the solfataras of Iceland, and supposed to be the result of molecular change, perhaps of longer exposure to the atmosphere. At Cairo I have

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\* From Jams, a kind of plant.

heard of both varieties being found in the old sea-cliff, the Jebel Mukattam.

M. Philipin and a small party, one sergeant and nine quarrymen, were directed to sink wells, 40 feet deep, round the pyramid, wherever surface indications suggested: old experience had taught me that such depth is necessary to strike brimstone-beds like those of Sicily. The borings brought up sulphur from 46 feet; six more were pierced, but they yielded nothing. During his sixteen working-days he sank five pits in and around the pyramid; the northernmost shaft, halfway up the hill, also gave crystals of the purest sulphur. And if the depth be not great, the surface extent is. The pyramid evidently forms the apex of a large vein trending north-south. The field consists of this cone and its dependencies, especially the yellow cliffs to the north and the south, facing, in the latter direction, a large plain cut by the Wady el-Kibrít; while a vein of the red variety, nearly 3 miles long by 25-30 inches broad, lies to the south-east near the gypsum-hill. The latter, again, yielded the crystallised salt which so often accompanies sulphur: the Bedawin brought in small specimens of rock-crystal and fragments of *negro-quartz*, apparently rich in metal, from the hill-masses to the east and south.

*Feb. 17th.*—At 3 P.M. we left the gunboat *Mukhbir* for the camp at El-Muwaylah. The path from Sharm Yáharr, now well-trodden, crosses a sandy plateau, metalled with the usual dark stones and silexes of the Desert. The horizontal lines of the wady buttresses argue submergence, emergence, and, lastly, the cutting out and fashioning of the torrents. The plain is deeply gashed by two short, broad and sandy gullies; where cliffs of coralline and sandstone-conglomerate, resting upon unsolid foundations, often cave in. The Hajj road, running farther east, heads these ugly nullahs. The third valley is the great Wady Surr ("making glad"), the *de facto* southern frontier of "Madyan Proper" (North Midian): we shall trace it to its head in the Hismá. Here, near the mouth, it is at least a mile and a half broad; the torrent, which flows only after the heaviest rains, swings to the southern bank away from the palm-orchards. On the right side are the garden-plots of vegetation, and the tobacco cultivated by the garrison.

*Feb. 18th.*—We visited and planned the ruins called Abu Háwáwit (حواويط)\* or the "Father of (dwelling) Walls," described in 'The Land of Midian (Revisited).' These remains,

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\* I presume the word to be a local and peculiar plural of "Háit," which generally forms "Hítán" and "Hiyát."

and the vestiges of furnaces lying near the north-eastern tower of the Fort, prove that, despite Wallin (p. 300), El-Muwaylah is an ancient settlement. Possibly it is the "ἵππος Κώμη, the Horse Village (and fort?) which Ptolemy (VI. vii.) places in N. lat.  $26^{\circ} 40'$  (true  $27^{\circ} 39'$ ); whilst his "ἵππος ὄρος would be the glorious Shárr, to which he almost correctly assigns N. lat.  $27^{\circ} 20'$ . We vainly asked, however, about the Wady Maktúb, the written or inscribed valley, placed by Ruppell two days east of El-Muwaylah.

II. *In the Hismá.*—The exploring party was now ready for the most serious part of its undertaking, a journey to the eastern regions, where the comparatively quiet and submissive tribes, subject to Egypt, encounter the robber-races that levy tribute from, instead of paying tribute to, the equally despotic and detestable Turkish Government of Syria. The expedition was divided into four. As has been said, Lieut. Yusuf was sent north and M. Philipin was stationed south; while the Greek dragoman and his assistant remained as magazine-men at the Fort el-Muwaylah: here also were left behind the sick officers and men. The main body consisted of Mr. Clarke, MM. Marie and Lacaze, Ahmed Kaptán, and Lieut. Amir; of two sergeants commanding the riflemen (Remingtons), with an equal number of quarrymen; the whole escorted by the Sayyid and by the three salaried Shaykhs, including our friend Furayj. This reduced the number of camels to sixty-one, and greatly facilitated marching.

*Feb. 19th.*—At 6.30 A.M. we left El-Muwaylah, riding up the Wady Surr, and 1 hour 15 minutes (= 3 miles) led us past the Abú Hawáwit ruins before mentioned. After travelling a total of 2 hours 45 minutes we found the Wady Surr becoming the gorge of the normal type; it is walled by old conglomerates of large elements forming dwarf precipices, some 40 feet high; and it receives a multitude of sandy influents, many reported to contain drinkable water. The principal features with names on the right bank are: the Sha'ab el-Jebel Malih (مليح), a nullah about a quarter-mile broad; the Jebel-el-Najil (نجل);\* the Wady Umm Shekák (شقاق), or "Mother of Clefts," and the Wady Umm Muzayrikát (مزيرقات), distant about 2 miles from the Najil. The left bank showed the Wady and Jebel Zahlattah (ضحاطه), the Jebel el-Hummaḥ

\* "Najil" is the name of a bitter herb.

(حمه), "of great heat," and the red pile of Jebel Maysarah, whose watercourse also feeds the Surr. After 3 hours 15 minutes (= 6 very slow miles) of actual marching and much dismounting, we halted for rest and reflection at a long piece of water in the section of the Surr which receives the Wady el-Najil. The pits proved that the sands rest upon the usual tenacious clay; besides flocks of sheep and goats, game—hare and partridge—was found; and a thorn-tree on the upper heights, instead of in the valley, was a pleasant and unusual spectacle.

We resumed the way about noon, remarking that the characteristic trap and porphyries now formed in the granite great veins, which dwarfed by comparison those of the quartz; whilst the sole was scattered with hard water-rolled serpentines and felspars, whose dove-coloured surfaces showed silver-white fibrils. Riding another hour (= 4 miles) to the eastward—a total of 4 hours 15 minutes (= 10 miles)—we suddenly saw our tents pitched in a widening of the Surr bed known as El-Safh (the level of) Jebel-Malayh: the latter word is the Doric Bedawi form of "Malih," a hill which we shall afterwards visit. The wide and almost circular basin receives and collects the produce of many large nullahs. To the north is the Wady el-Guwaymarah (قويمري); to the north-east the Wady "Ma-

layh;" to the east the upper course of the Wady Surr, and to the south-east the Wady Kusayb. The Surr gorge here shows gloomy and precipitous walls of dark and polished trap, contrasting strongly with the glaring yellow sole of stone, gravel, and sand; and, about a mile up it, drinkable water and palm-bush appear. The Wady Kusayb was reported, falsely as we afterwards found, to contain "Hawáwít" (ruins).\*

*Feb. 20th.*—Yesterday we had come out of our way to inspect the Surr, that is, we had travelled eastward instead of north-eastward. Consequently the whole of this march was northerly, in order to strike the main commercial road connecting El-Muwaylah with Tabúk.† From the sea-board the Surr, which drains the northern and eastern flanks of the Shárr mountain-block, appears the directest line into the interior; we shall presently see the reason why the devious upper line is preferred by the trader.

The usual road lies up the Wady Guwaymarah, whose eastern bank shows extensive gneiss and schistose formations. From this point the little detached rock, Umm Jedayl, with grey

\* March 14 proved that the informants had drawn upon their fancies.

† Vol. i. chap. x.

granites gleaming white over the dark-red and brown foot-hills, assumes the shape of a saddle-back: its crupper was pointed out to us as the site of a ruined city, "El-Khulasah" (خلصه).\*

After walking about half an hour, we turned eastward into the Wady el-Khulasah, whose vegetation was charming after the sterility of the coast. Our guide led us towards the Shárr, that is, with our backs turned to this day's camping-ground; and, when we had walked 1 hour 30 minutes (=  $4\frac{1}{2}$  miles), he confessed that El-Khulasah was unknown to him. He added that the site of another ruin, El-Zebayyib, was about 2 miles distant, a little beyond a bright red peak "Abá 'l-bárid" on the left bank of the Khulasah Fiumara. The Bedawin of Midian universally use the accusative (Abá) when others would prefer the nominative, Abú: apparently this change takes place before the article as "Abá 'l-Marú;" not when it is absent, as in "Abú Hawáwít."

Mr. Clarke rode off with the guide; and, instead of hugging Abá 'l-bárid, behind which a short watercourse was the straightest way, he struck to the right of the Khulasah, crossed a rough divide, and fell, after riding some 6 instead of 2 miles, into the upper section of the Wady Surr. On its right bank he found the ruins which we shall presently visit.†

Meanwhile we retraced our steps down the Wady, whose Jebel (El-Khulasah) lay now to our left. The lower valley shows a few broken walls, old Arab graves, and other signs of ancient habitation; but I am convinced that, despite all our exertions, we missed the ruins which lay somewhere in the neighbourhood. Presently on our left the Wady Kámirah leaves the Wady Kuwaymarah, and falls into the sea 1 mile north of "Shaykh Abdullah," patron saint of El-Muwaylah. To the right lay the western foot-hills of the Umm Jedayl, especially the Jebel el-Ramzah, with its red crest and veins. The path ran over granitic gravel, strewn with quartz, whole and broken, like the land about the Jebel el-Abyaz; much of it seemed to come from the Wady Umm Jedayl el-Atshán (عطشان), the "Thirsty," as opposed to El-Rawiyán, the "flowing." We advanced to a fine valley, the Sayl Wady el-Jimm; and now I learnt, for the first time, that El-Jimm (جم) is the name not of a height, but of a Sha'b or gully in which water collects (يجمع). In my vol. i., chap. v., where occur several differences

\* The celebrated idol of the Aden Arabs was called El-Khalasat.

† See part ii. sect. v., March 15.

of nomenclature, the Jebel el-Jimm was mentioned as the mountain of the truncated tower, when the latter is a mere saddle-back in the Dibbagh (دبج) block. The Wady "Zojeh" (p. 128) should be *Wady Kh'shabriyyah*. As regards the names "Fara' el-Samghi"\* and "Abu Zayn" (ibid.), I could learn nothing: in p. 129, the dome-capped rock is wrongly called "Abu Zayn," instead of *Jebel Harb*. For the latter, which is ignored (note, p. 128), see chap. xiii., 'The Land of Midian (Revisited).' "Sadr," also, is made a mountain, instead of a great wady.

The Eastern Gháts now show a break in the line of axis separating the Umm Jedayl from its northern neighbour, the tower'd Dibbagh. It is generally known as the Wady Kh'shabriyyah (خشبورية), after its Jebel of the same name, a remarkable peak which it drains to the Wady Sadr. The valley, apparently a fine road, is, they say, closed to camels by Wa'r, or stony ground; of its ruins we shall presently hear more.† We drank the water of the Sha'b Ridayh (ردية). The total

march occupied 4 hours (=10½ miles), and the rhumbs were north, north-east, west, and again north.

Feb. 21st.—We set out at 6.30 A.M. across the broad Sayl (torrent-bed) towards a bay in the mountains bearing N.N.W. This is the mouth of the Wady Zannárah, which, after running 2-3 miles falls into the Wady Tiryam. After walking 30 minutes we entered its eastern branch, the Wady el-Liwéwí (لويوى),‡ the "Weiwi" of Wallin (p. 304). We passed east of the Jebel of the same name; and a short cut, the Sha'b el-Liwéwí, led over a great northern bend in the bed. The path was wild riding and very winding, at times turning almost due east when our general direction was N.N.E. Returning to the Wady Liwéwí, and ascending it for a few yards, we began the second short cut of 50 minutes to save a 2 hours' bend; the deep drops, and the narrow gutters in the quartz-veined granite, compelled even the Shaykhs to dismount from their dromedaries during the descent. This section is called the Wa'r el-Ga'gah (جعاجه) § *alias* Sa-wáwín, the latter also the name of a valley farther on.

After a ride of 3 hours 10 minutes (= 8 miles), we halted

\* See, however, part ii. sect. v.

† Part ii. sect. v.

‡ *Lawa* would mean winding (a valley).

§ In pure Arabic *Ja'ja'* would be rough ground, a bad defile.

at the conjunction of the Wady Liwéwí with the Sadr (the chief or pre-eminent). The latter is the upper course of the Wady Tiryam, and we shall follow it to its head. The Wadys Kahlah and Zamahrah, which, during our first journey, had been described to us as the main passes over the eastern range, proved to be mere secondary branches lying north of the Wady Sadr. Wallin, whose line was a little north of ours, calls the first "El-Kahalé" (i.e. of the *Echium* or borage-plant), and travelled up it, for 1 hour 20 minutes; its north-eastern prolongation, "Al-Huleikâ" (El-Hulaykah, the "Little shaven"), separates the Fás and the Harb blocks; and I heard also of a Nakb el-Hulaykah.

At the junction of the Liwéwí-Sadr we were joined by the caravan, which had made three long legs, to north, to north-east, and to east. We now struck up the Wady Sadr, a scene wild and weird enough for Scotland or Scandinavia. On the right or southern bank towers the great Harb mass, whose dome, single when sighted from the west, here shows three several heads. Opposite it, at the northernmost end of the Dibbagh block, rises the huge tower conspicuous from the sea-board: a little farther eastward, it will prove to be the monstrous pommel of a dwarf saddle-back. As it has apparently no name, we called it the "Burj Jebel Dibbagh."

The Wady Sadr was deserted of man, although the Ma'ázah are not far off. The Beni 'Ukbah had temporarily abandoned these grazing grounds for the Surr. Passing the Sha'b Turbán, a cleft in the Dibbagh, said to contain rain-water, after another hour (= 3 miles), and a total of 4 hours 10 minutes (= 11 miles), we halted for the night at the mouth of the Sayl el-Nagwah (نَجْوَة), of "High Ground." This torrent-bed lies at the foot

of the granite block, an outlier of the Dibbagh, similarly named (from tanning?). Its gap, the Sha'b el-Murayfal, supplied us with tolerable rain-water. The sole of the Sadr was parti-coloured. The sands of the deeper line to the right are tinctured cool green by the degradation of the porphyritic traps, here towering in the largest masses yet seen; whilst the gravel of the left bank looks warm with red grit and syenitic granite.

*Feb. 22nd.*—We left the Nagwah at 7 A.M., and passed on the right a granite outcrop in the wady-bed, a reduced copy of the "Burj." After an hour's slow walk (=  $2\frac{1}{2}$  miles), we were led, dismounted, to a rock-spur projected northwards from the left or southern bank. It separates two adjacent "Sayls," mere bays in the Dibbagh block, the western Sha'b Burayrig (Burarayg?), from the Eastern Sayl Umm Laban: they front

the Sha'b el-Namrah (of the "she Leopard") on the northern bank, a line which is said to contain water and palms. Upon the rock-spur we found spalled quartz, traces of a zigzag road, and signs of an *atelier*; but the settlement, if there ever was one, had entirely disappeared.

Resuming our ride, we dismounted after 1 hour 15 minutes (=4 miles) at the half-way Mahattah (halting-place), a *rond-point* in the Wady Sadr, marked from afar by a tall blue pyramid, the Jebel el-Ga'lah (جعلله).<sup>\*</sup> We spent some time examining this interesting bulge. Here the Jibál el-Tihámah end, and the eastern parallel range, the Jibál el-Shafah, begin. The former belong to the Huwaytát and to Egypt: the latter to the Ma'ázah and Syria. The frontier is well defined by two large watercourses, running nearly on a meridian, and both finding the main drain, the great Sadr-Tiryam. The northern branch, Wady Sawádah, divides the granitic group from the porphyritic Jebel Sawádah; the southern, Wady Aylán (ايلان), separates the Dibbagh from the Jebel Aylán.

The rest of our march eastwards will now lie through the Shafah Range. It resembles, on the whole, the Tihámah Gháts; but it wants their charms. The granites which farther west pierced the traps, Wallin's "dark brown sandstone" (p. 305), now appear only at intervals. This I am told is the case throughout the northern prolongation of the "Lip Range:" for instance, in the Wady branch separating Jebel Urnub from its southern neighbour, the Jebel Fás; and in the Wady el-Halaykah, the watercourse immediately south, feeding the Wady el-Kahlah. In the southern "Shafah" we saw it for ourselves. At the same time there is no distinct separation, no wide plain, between the two parallel ranges, the maritime and the inland. They are topographical continuations of each other.

At the halting-place, we first made acquaintance with the Ma'ázah, and the meeting was decidedly unpleasant. About 11 A.M. we remounted, crossed a Wa'r to save time, and again fell into the upper Wady Sadr. Here the right bank receives the Wady Sawáwín (Suwaywín), draining the eastern mountains. Wallin (p. 305) ascended its "difficult track," and found it encumbered with huge stones and detritus from the adjacent blocks. Its pass, the "very steep defile," Nakb el-Sawáwín, placed him at Wady Rawiyán, beyond the crest of the Hismá plateau.

From the right bank of the Sadr, the branch Wady Sahlúláh

<sup>\*</sup> Ga'lah means either a worthless palm-tree, whose fruit cannot be plucked, or a young palm-shoot.



(صهلولة) runs to the Wady and Jebel Gahd (Jahd, "of Struggling"), the quartz-region before explored by Lieut. Amir. We followed various bends to the south and the south-east, with a general south-south-eastern direction, the Jibál 'Azzázah (عزازة) being on our right. The plains were scat-

tered with women tending sheep and goats: the former have a fine "tog," and sell for \$3½. At last we came to another Wa'r, and, on the right side of the rocky tongue, where the northern face falls pretty stiffly into the valley, we found a pot-hole of rain-water rejoicing in the grand name "Muwáh (for *Miyáh*) el-Rikáb"—the "Waters of the Caravan."

After a second spell of 2 hours (=7 miles), and a total of 5 hours 15 minutes (=13½ miles), we again camped in the Sadr Valley. The altitude was about 3200 feet (aner. 27·80); and, though the thermometer showed 66° (F.) at 5 P.M., fires inside as well as outside the mess-tent were required. A wester (sea-breeze), deflected by the ravines to a norther, was blowing hard; and in these regions, as in the far north of Europe, wind makes all the difference of temperature. During the evening we were visited by the Ma'ázah Bedawin of a neighbouring encampment: they began to notice stolen camels, and to wrangle over past times—another bad sign.

*Feb. 23rd.*—Setting out at 6.45 on a splendidly clear morning, when the towering heads of Harb and Dibbagh looked only a few furlongs away from us, we imprudently preceded as usual the escort; an excessive timidity on the part of our men had made us rash. Walking 30 minutes (=1½ mile) we passed some black tents on the left bank, and the Ma'ázah, at once lighting their matchlocks, manned a rocky narrow in the upper bed, and set up their war-song. We were advised to halt till our soldiers and Arabs came up with a run, and then it turned out that "there had been some mistake." But as the women, children, and animals remained in the tents instead of flying to the hills, I felt convinced that the demonstration had been ordered from head-quarters, with the object of infusing into our spirits a wholesome awe. I ended by taking a Ghafir, or "guide," and both parties went their ways rejoicing.

The upper Sadr, winding through the usual red and green hills, showed a much finer vegetation, the effect of increasing altitude. The chief plants were the thorny Kidád (*Astragalus Forskählti*); the purple bugloss, El-Kahlá (*Echium*); the Jarad thorn, the wild hyacinth; Lavandula, Salvia, Verbena, Reseda (*canescens*?), Tribulus (*terrestris*), and the red and yellow

Bromus grass; with the familiar Cassia (*Senna*), *Artemisia* and *Cucumis* (*Colocynthus*); the *Genista*, or broom, *Ratama* (*B. Ratama*),\* and the *Cytisus*, with golden bloom. Presently it opened upon a large basin, the Ras (head) Wady Sadr: this is the second Arab stage from El-Muwaylah. In front of us the Jibál Sadr extended far to the right and left, a slight depression showing the Khuraytat, or Pass, which was to be ascended on the morrow. To the left (north) appeared the Jebel and Wady el-Safrá, discharging a quantity of quartz and syenite. At the mouth of this "yellow" watercourse stood a knob of hill, the Jebel, concerning which the wildest tales, golden gleam by day, and fire by night, had been told to us.

We reached our tents in 3 hours (=9 miles), travelling generally to the E.S.E., and found them pitched below the Jebel Kibár (كبار), whose Sha'b lay to the south. From this

point the Harb apex bore 303°, the Dibbagh 285°, and the Sahhárah, a blue peak visible from the sea, 274° (all mag.). We were remounting to ascend a neighbouring hill which commands a prospect of the Hismá plateau, when we sighted from afar the Ma'ázah chiefs riding in to meet us. They numbered five, viz., the head-Shaykh, Mohammed bin 'Atiyyah; his son Sálím; his brother, the wrinkled Sagr (Sakr); and his two nephews, 'Ali and 'Abayd. Everything went off well at the formal reception, and they agreed to escort us up the Pass on the morrow. The aneroid showed a height of 3000 feet (26·91, the mean of three obs.), and the violent wind at mid-night sank the mercury to 38° (F.). It was intensely cold.

*Feb. 24th.*—Overcoming the last objections of our unhappy Huwaytát, who felt themselves being led into the lion's den, we struck tents and set out at 7.15 A.M. About 1 hour (=1½ mile), over rough and rocky ground, leads to the northern pass, called Khuraytat el-Hismá, or El-Jils (جلس),

*Jals* meaning in classical Arabic "a high hill, a hard and broken surface." Thus it is distinguished from the Khuraytat el-Zibá (the "Zibá-pass"), because leading to that port; alias Khuraytat el-Tehāmāh, the Ma'ázi pronunciation of "Tihāmah." This was remarked by Wallin (p. 305), who wrote "Al-Tāhāmá."

The zigzag path now ascends a ladder of rocks, following the line of a mountain torrent, the natural pass, crossing its bed from left to right; and again from right to left. It is the rudest of *corniches*, worn by the feet of man and beast, and

\* This name for the *Spartium* is pure Hebrew (סרתם).

broken by ugly abrupt turns. The absolute height was about 450 feet (aner. 26·70–26·25), the length half a mile, and the general direction lay, like the day's march, due east (mag.). The ground, composed mainly of irregular rock-steps, offers little difficulty to horse and mule; but it was a marvel to me how the laden camels ascended and descended without accident.

We halted on the *Safh el-Nakb*, the "Level (summit) of the Pass," to await the caravan, and to prospect the surrounding novelties. Heaps of dark trap dotted the lip, like old graves; many stones were inscribed with *Wusúm* (وسوم), or tribal

marks; and two detached pebbles bore | H and V |, which looked exceedingly like Europe. Some of the piles were capped with snowy lumps of quartz, to serve as memorials, a common practice in these regions. We picked up copper-stained quartz, like that of 'Aynúnah; fine specimens of iron and dove-coloured serpentine, with silvery threads and streaks.

We then ascended the *Jebel el-Khuraytah*, a trap hillock some 120 feet high, and had a fine view westward through the inverted arch formed by the two staples of the Pass, and down the long valley (*Sadr*) which had given us passage. Hence the *Harb* dome bore 300°, the *Dibbagh* apex 286°, the *Umm Jedayl* 268°, and the middle *Shárr* 240° (all mag.). The eastern faces of these coast giants appear well above the *Shafah* range, and our altitude, some 3800 feet, gave us, to a certain extent, a measure of their grand proportions. Down the *Sadr* the eye distinguishes a dozen distances, whose several planes are defined by all the shades of colour that the most varied vegetation can show. And here I must delay for a time, to explain the change of scene and region.

We now stand upon the westernmost edge of the great central Arabian plateau known as *El-Nejd*, the highland, opposed to *El-Tihámah*, the lowland, regions. In Africa we should call it the "true," subtending the "false" coast; beautiful *Dahome* compared with hideous *Lagos*. The Arabian geographers justly observe that the valleys of the *Tihámah* descend westward to the sea, whilst those of the *Nejd* drain eastwards to inner Arabia. Again they distinguish the flora. The former produces the *Mimosa* (*Samur*),\* the *Acacia* (*A. gummifera*), and the *Tamarisk* (*Asal*†), whereas the latter grows the "shrub called *Ghadá*."

\* The botanists have adopted the plural of the "*Samurat*" as a singular.

† Mr. Ayrton, in his notes in 'Wallin' (p. 306), translates "*Asal*" (*Athl*) by "species of *Acacia*." The Arab name of the *Tamarix orientalis* is pure Hebrew (צֶמַח).

This upland, running parallel with the Lip-range and with the maritime Gháts, is the far-famed Hismá. It probably represents a remnant of the old terrace which, like the secondary gypseous formation, has been torn to pieces by the volcanic region to the east, and by the plutonic upheavals to the west. The length may be 170 miles, the northern limit is either close to, or a little south of, Fort Ma'án;\* and we shall see the southern terminus of the Hismá proper sharply defined on a parallel with the central Shárr, but not extending, as we had been told, to the latitude of El-Wijh. The latter, however, would not be far out, if the "Jaww"† be considered, as certain of the Bedawin say, a continuation of the Hismá, under another name. An inaccessible fortress to the south, it is approached on the south-west by difficult passes, easily defended against man and beast. Farther north, however, the Wadys 'Afál (about El-Sharaf), El-Hakl (Hagul), and El-Yitm, near El-'Akabá, are easy lines without Wa'r (stony ground), or Nakb (ravine-cols).

The Hismá material is a loose modern sandstone, showing every hue between blood-red, rose-pink and dead, dull white: again and again fragments had been pointed out to us in ruined buildings and in the remains of hand-mills and rub-stones near the coast. Possibly the true coal-measures may underlie it, especially if the rocks east of Petra be, as some travellers state, a region of the Old, not of the New Red. According to my informants, it has no hills of quartz, a rock which appears everywhere except in the Hismá; nor should I expect the region to be metalliferous.

On the summit of the trap-hillock Jebel el-Khuraytat, the southern jamb of the Khuraytat gate, we found a ruined "Burj," measuring 46 feet in diameter. This commanding site gives a splendid and striking view. After hard, dry living on grizzly mountain and unlovely wady, the fine open plain, slightly concave in the centre, was a delightful change of diet to the eye—the first enjoyable sensation of the kind since we had gazed lovingly upon the broad bosom of the Wady el-'Arabá. The general appearance is that of Eastern Syria, especially the Haurán. At the present season all is a sheet of pinkish-red, which in March will turn to lively green. On

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\* As has been shown, the Bedawi Shaykh of El-'Akabá placed the northern limit one march south of El-Ma'án (the Waters), while Wallin (p. 308) makes it head at that settlement and end at Tabúk, in the south. His words are, "The Jibál el-Harrah advances in a north-easterly direction, till it gradually sinks into irregular hillocks in the neighbourhood of Tabúk."

† Meaning air, sky, low ground, or open space: it is also an equivalent of the old term Yemámah, which comprehended El-Nejd, El-Tihámah, Bahrayn, and Omán; in fact, Northern Arabia.

this parallel the diameter does not exceed a day's march, but we see it broadening to the north. Looking in that direction, over the gloomy metallised porphyritic slopes upon which we stand, the glance extends to a sea-horizon, while the several plains below it are dotted with hills and hill-ranges, white, red, and black: all are distance-dwarfed to the size of thimbles and pincushions. The guides especially pointed out the ridge El-Mukaykam, a red block upon red sands, and a far-famed rendezvous for raid and razzia. Nearer, the dark lumps of El-Khayráni rise from a similar surface; nearer still lie the two white dots, El-Rakhamatayn (the "Two Vultures"), and nearest is the ruddy ridge, "Jebel " and "Jils el-Rawiyán," containing, they say, ruins and inscriptions, of which Wallin did not even hear.

The eastern versant of the Hismá is marked by long chaplets of tree and shrub, disposed along the selvage of the water-courses; and the latter are pitted with wells built up after the fashion of the Bedawin. In this rhumb the horizon is bounded by El-Harrah, the volcanic region, whose black, porous lavas and honeycombed basalts, often charged with white zeolite, are still brought down even to the coast, where they serve as mortars and hand-mills. The profile is a long, straight, and regular line, as if formed under water, capped here and there by a tiny head like the Syrian "Kulayb Haurán." Its peculiar dorsum makes it distinguishable from afar, and we could easily trace it from the upper heights of the Shárr. It is evidently a section of the mighty plutonic outbreak, which has done so much to change the aspect of the parallel Midian seaboard. Wallin's account of it (pp. 307-309) is confined to the place where he crossed the lava-flood. I believe him to be wrong where he tells us (p. 309) that the southern boundary of the Hismá plain, is "formed by the steep front of a lateral chain of hills (*El Harrah*) which branches out at an acute angle from the Shafah chain." The two formations—Shafah and Harrah—are palpably and completely distinct. Again he says, "From the acute angle, named al-Zawiié (El-Záwiyah, the Corner),\* thus formed between the Shafah chain and its lateral branch of Harrá, the land of al-Hismá gradually opens out into an extensive plain." But the Hismá extends far southwards, forming the "Jaww," and the Harrah even farther. Finally, he renders "El-Harrah," which, in Arabic, always applies to a burnt region, by "red-coloured sandstone."

The Bedawin far more reasonably declare that this Harrah

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\* Also meaning a cell. The "Jibál el-Záwiyah" will be noticed further on.

is not a mere patch, as it appears in Wallin's map. My worthy predecessor made it a narrow oblong not exceeding 60 miles (N. lat. 27°-28°), and disposed diagonally from north-west to south-east; while (p. 323) he considers it "as a rhomboid, with its angles facing the four cardinal points." According to the people, it is a region at least as large as the Hismá; and it extends southwards, not only to the parallel of El-Medinah, but to the neighbourhood of Yambú (?). The upper region has two great divisions; the Harrat-Hismá, or *The Harrah par excellence*, which belongs to the Ma'ázah, and which extends southwards through El-Sulaysilah as far as the Jaww (جو).

This latter region, a tract of yellow sand, dotted with ruddy hills, apparently, I have said, a prolongation of the Hismá, separates it from the Harrat el-'Awayraz (عويرض), in which the Jebel el-Muharrak lies.\* The line of vulcanism is continued south by the Harrat el-Mushrif (P. N. of a man); by the Harrat Sutúh (ستوح) Jaydá;† and, finally, by the Harrat el-Buhayr (بحير). The latter rises close behind the shore at

El-Haurá, where it is in the same latitude as El-Medinah, and where we shall presently sight it. There is great interest and a genuine importance in this large coast-subtending eruptive range, whose eastern counterslope demands careful study. The "Jaww" has not yet been visited by Europeans: but the country, lying through the lands of the peaceful Baliyy, offers no difficulties.

Sweeping the glance round to south, we see the southern head of the "Jilsayn," two tall mountains of horizontal strata, with ironstone in harder lines and finial blocks. This is the Jils el-Dáim," so distinguished from the northern Jils el-Bawiyán. The lower edge of the Hismá cliffs rises in red and quoin-like masses, the Jibál el-Záwiyah; and then falls suddenly, with a succession of great breaks, into the sub-maritime levels. During our next ten days' travel we shall be almost in continuous sight of its southern ramparts and buttresses. Far over the precipices stretch the low yellow sands of the Rahabah (رحبة), alias the Wady Dámah; and behind it towers the

\* For notices of this "Burnt Mountain," so well-known at El-Wijh, see 'The Land of Midian (Revisited),' chap. xviii.

† Sutúh Jaydá would mean the "flats of the fine-necked" (woman, mare camel).

skyblue mountain-block, which takes its name from the ruins of Shaghab and Shuwák.

When the caravan reached the pass-summit, we accompanied it to the nearest camping-ground, about 30 minutes (= 1 mile) from the Col; and thus giving the day a total of 2 hours (= 3 miles). It lies to the west of the red Jils el-Rawiyán, and is supplied with excellent drinking-water by the Miyáh el-Jedayd, lying about 1000 yards to the south-east. On the other hand, fuel, here a necessary of life, was wanting, nor could the camels find forage. Luckily for ourselves, we had camped upon the very edge of the Hismá; and the Ma'ázah Shaykhs showed much disappointment at our not making their quarters on the far side.

In the evening matters assumed a threatening aspect. It was rumoured that the Ma'ázah, refusing to allow the Huwayti camels to carry us, had sent messengers to collect their own animals; and this of course was interpreted to mean a gathering of the tribe. Besides the want of fuel and fodder, the Shaykhs and their followers were eating us up, and began to debate whether they should charge us as blackmail for free-passage \$100 or \$200 per diem. And, worst of all, quarrels about the past were beginning amongst the camel-men.

I was sorely disappointed for more reasons than one. The chief object of this march was to investigate the inland depth of the metalliferous deposits; their extent from west to east; and our only chance of finding a virgin California would be in the unknown tracts lying to the east of the "Harrahs." Moreover, all manner of archaeological remains were reported; the Jils el-Rawiyán famed for "Hawáwít;" the ruins of El-Ruáfá almost in sight; and Karáyyá, on the Damascus road, which Wallin (p. 316) was unable to visit. Lastly, when too late to inspect the place, I secured a fragmentary Nabathæan inscription finely cut in soft white sandstone. Too bad to have every object thwarted by the exorbitant demands of a handful of thieves!

Yet a retreat was, under the circumstances, necessary. I will not trouble the reader with my reasons; he will readily believe that none but the most urgent compelled me to take such a step.

*Feb. 25th* began with a violent discussion, which ended with my having to pay at the rate of \$100 per diem—\$200 into the hands of the Shaykh, Mohammed bin 'Atiyyah. After this *avanie*, we were escorted with due civility by our plunderers. We reached the foot of the Khuraytat el-Jils in 26 minutes, and, after a short delay to collect the caravan, we

began to descend the Southern Col, the Khuraytat el-Zibá. Here the watershed of the Wady Surr (of El-Muwaylah) heads; and merchants object to its shorter line because their camels must climb two ladders of rock instead of one. The descent was much longer, and but little less troublesome than its northern neighbour; the formation was the same, and 45 minutes placed us in a sandy gully that presently widened to a big valley, the Wady Dahal (دحل, of the "Water-holes") or Wady el-Khuraytat. We reached the camping-place at 12.30 P.M., and laid down the march from the summit of the Northern Col at 3½ miles.

That night was passed at some distance below the water of the Wady Dahal. The place is known as the Jayb el-Khuraytat ("Collar of the Col"). The term "Jayb," meaning a broader and larger feature than a wady, and in pure Arabic denoting the entrance into a country, is locally applied to two places only; the other is the Jayb el-Sa'úwwah, which we shall presently visit. We are now about 35½ direct geographical miles from El-Muwaylah, east with a trifle of northing; a march of 12 hours for dromedaries. Thus the distance from the Port to the Hismá would measure by this road a little under 40 miles.

III. *To the ruins of Shaghab and Shuwák.*—We have now left the region explored by Europeans, and our line, to the south and the south-east, will lie over new ground. The land in front of us is no longer "Madyan": we are entering the South Midian, which will extend to El-Hejaz, of which, according to some of the Arabian geographers, it forms a part.

*Feb. 26th.*—We set out at 6.15 A.M., down the Wadys Dahal and Affán (عفان P. N. of man), and made a considerable round between s.s.e. and s.e. to avoid the stone-torrents discharged by the valleys and gorges of the Shafah Range on our left hand. On the right (west) rose the Jebel Sula (صلع) and other outliers of the Tihámah Mountains, above whose nearer heights towered the pale peaks of the Shárr. Between the two is a network of nullahs, the upper branches of the Wady Sa'úwwah (صعلوه). This well-wooded Fiumara runs nearly southwards, passes along the mountain of the same name, and feeds the great Wady Dámah (دامه).

At 9 A.M. we left the Sa'úwwah, and turned abruptly eastward up the Wady el-Sulaysalah, whose head, draining the Hismá, falls sharply from the Shafah Range. The ground is



still that of the plateau, red sand with blocks of ruddy grit; and, according to Shaykh Furayj, it forms the south-western limit of the Harrah. The surface is honeycombed into man-traps by ground-rats and lizards. The former, called Girdi (جردى), in classical Arabic "Jirdaun" (جردون), means a ground-rat or field-mouse. Like the Jerboa it must be nocturnal, for we never saw during the day a live specimen.

We then ascended the rough and rocky divide known as the Tala't Majrá Ruways, "Rise of the Watershed of Ruways." The Midianite Bedawin pronounce Majrá (مجرأ), literally, a place of flowing, a watershed (wasserscheide), a versant, as if it were written Maghráh (مقرأ); but the latter is not

known to the dictionaries. Prof. Palmer ('Desert of the Exod.' Appendix E) translates the Sinaitic "Magráh, or Majráh," by "a hollow or depression in which rain-water collects." He also finds in the Nejed (Negeb) a Jebal Magrah; the Rev. William Holland writes "Jebal Mugrah, never before penetrated by travellers, and far from correctly laid down in the map" (Brit. Ass., Aug. 15, 1878). My learned friend Sprenger thinks that the two words, *Majrá* and *Magráh*, may be identical; but as Arabic dictionaries are, at the best, imperfect, he advises me to write the word as it is pronounced.

On the right of the track lies the ugly tormented ridge El-Ruways (رويث); to the left the queer isolated lump Jebel el-Muraytbah (مريطبة), of the "Sweet Well").\* The latter, grey granite of coarse elements, has upraised and imbedded in its substance the more ancient traps; in its turn it has been cut by long horizontal dykes of the hardest quadrangular basalt. After this point the regular granite sequence disappears, nor will it again become visible till we reach Shaghab (March 2).

As yet we had only ridden 4 hours (= 11 miles), and we had remounted, after noon, for a long spell, when the cry arose that the "Water of El-Muraytbah" was dried up. It is not a rain-pool, but a spring rising slowly in the sand-stuffing of three fissures in the granite, lying parallel with one another, and at different levels. The highest and principal crevice, easily cleared out, produced a supply potable but slightly sulphurous

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\* Martabah is a sweet (well) lying between saline (springs). If written with the first "t" the word would mean "of the little steps."

and chalybeate. The delay, however, brought this day's work to a close. The Shaykhs will now fight hard for 4-hour days.

Our evening was cheered by the sight of the Hismá. We forgot the hot unlively march, the thirsty mules, and the insect world that persecuted us, in the presence of the weird and fascinating aspect of the southern plateau-wall rising opposite the camp, and distant about a mile from the dull drab-coloured basin El-Magráh. Based upon mighty and massive formations of brown and green trap, the undulating junction being well defined by a horizontal white line, the capping of sandstone rises regular, as if laid in courses, with a huge rampart, the *Taur* (كور) *el-Shafah*, or "inaccessible (part) of the Lip

Range," falling perpendicular upon the natural slope of its glacié. Farther eastward the continuity of the coping is broken by what the Bedawin here call El-Girágir (جراجر),\* the

most remarkable of castellations. As we progress south-eastward, we shall find them curving from north-east to south-east, in a manner of scorpion's tail, with detached vertebræ, torn and wasted by the adjacent plutonic rocks. Viewed from the west, the Girágir look like red reefs and islets rising above the great gloomy waves of trap and porphyry; and in places they are backed by the horizontal lines, lavas and basalts, of the straight-backed Harrah. From the Dámah watercourse the castled crags appear art-like enough to suggest haunted ground, a glimpse of the city of Brass built somewhere hereabouts by the olden king, Shaddád ibn 'Ad.

*Feb. 27th.*—At 6 A.M. we began the march by striking eastward over the rim of the dull basin. Here is an old made road, a cornice about  $1\frac{1}{2}$  mile long, cut in the stony flanks of a hill whose head projects southwards into the broad Wady Hujayl (حجيل, "the Little Partridge"). The latter seems to drain

inland; presently it bends round by the east, and feeds the main artery, Wady Dámah. Rain must have fallen, for we found many plants flowering, especially the Hargul (حرجل), a *Rhazya (stricta)*, which fills the air with its lavish fragrance, and the distaff-like "Masnur" (*Fungus melitensis*, or *Cynomorium coccineum*), of which the Arabs "cook bread." Yellow is the prevailing tint of the vegetation throughout Midian, often

\* Jurájir would mean noisily rushing water, from Jarjar, a word similar to our "gurgle."

suggesting the careless wheat-fields of England, in which "shillock," called wild mustard, abounds; and here we miss the lovely anemones, the papavers, and the mauve and white cyclamens of Syria. Future collectors of botany are warned that the vegetable follows the rule of the mineral kingdom: every march exhibits something new, and he who neglects to gather specimens in one valley, will often miss them in its neighbours.

A denser line of trees down the Wady Hujayl showed the water of Amdán (امدان), which others called "Mídán;"\* represented

to be 6 hours distant from our last camp, it was passed after 1 hour 30 minutes. To the left, and facing us, rose the Gírágir, all decayed Hismá, blurred and broken by the morning mist. Presently turning to the south-east, we struck across a second wild divide into the Wady el-Aráish (ارایش), another feeder

of the Wady Dámah running southwards. Like yesterday, the loose red sand is Hismá-ground, and it is scattered with blocks of the Harrah-lava. The walls are burnished felsite and green porphyritic trap, a barren ugly formation which will haunt us for several marches.

After riding 4 hours (= 12 miles) we halted in a short watercourse, the Wady el-Girágir. Here we could prospect the northern basin of the great Wady Dámah, whose plain is also known as El-Rahabah, the open (abode)—the Rahab or Rehoboth ("Spaces") of the Hebrews, the *πλατεία* of the Greeks. In Arabic it applies especially to valleys over whose every part water flows. Dámah is probably a corruption of Daamá, the hole of the jerboa, or the field-mouse. This notable feature, famed as an Arabian Arkadía, is a "Haddúdah," or frontier divide, which in days of yore separated the "Ukbiyyah" (Ukbi-land) to the north from the "Balawíyyah" (Bali-land) south. The latter tribe still claim it as a northern limit. The author of the *Masálik el-Absár-fi Mamálik el-Amsár*† (the 'Paths of Clear-seeing in the Dominions of Cities') says, "Their abodes are now in Dámá, which is the land between the Uyún el-Kasab (Aynunáh) and El-Akrá, at the mouth of the Mazík (defile)." Now, however, the intrusive Huwaytát have pushed their way far beyond this bourne. The actual owners, the Sulaymiyyín, the Sulaymát, the Jeráfin, and other Huwayti tribes, are a less turbulent race than the northerns, because they are safe from the bandit Ma'ázah and they live in the presence of their brethren. The

\* In Arabic "immidán" means surface-water.

† The work of (Abū'l 'Abbás Shiháb el-Dín) Ahmed ibn Yahyá in the early part of the fourteenth century (nat. A. H. 700, ob. 749).

Dámah head is a great bay in the Hismá-wall to the east, and below Zibá we shall steam across its mouth. The valley is equally abundant in herds of camels, flocks, and vegetation; in places it is adorned by tree-clumps and a thin open forest. The broad loose sole of ruddy sand is fearfully burrowed and honeycombed; and, like its sister the Wady Sadr, it is exposed to the frequent assaults of the Zaubah' (زوبعة)\*, or dust-

"devil." That it is plentifully supplied with water, we learn from the birds which muster in force: the *Caravane*, or "knock-kneed plover;" the Egyptian Rakham (*Neophron percnopterus*); the lovely little "Sunbird" (*Nectarinia Oseæ*); the brown swallow of the Nile banks, and flights of ravens (*Ghuráb el-Bayn*), highly intelligent animals which are as destructive as falcons.

We rode on for 1 hour 45 minutes (=5 miles) and a total of 5 hours 45 minutes (=17 miles); crossed the "Thalweg" of the Dámah, and camped on its left bank, near the Jebel el-Balawi. The water known as Máyet el-Jibayl ("of the Hillock") lay about 30 minutes ahead in a lone rocky snout. Before sleeping we were visited by an old Bedawiyyah (woman), who brought a goat for sale; she had a long tale to tell of neighbouring ruins, especially a well with steps, into which the Arabs had descended some seven Kámát ("statures," i.e. fathoms). Presently they found houses in the galleries at the bottom and fled in terror. The legend is common throughout Midian; but we could not trace its origin.

*Feb. 28th.*—Lieut. Amir was sent to sketch and survey the reported remains, under the guidance of a Sulaymi Bedawi, Sa'id ibn Zayfullah, who, according to his own account, must have been a centagenarian. He named the ruins Dár ("house"), or Diyár ("houses"), El-Nasará; that is, of the Nabathæans. The former term "of the Nazarenes" is here retained by popular tradition, while the *Nabat* are clean forgotten: the same is the case in the Sinaitic Peninsula which Dr. Beke calls of Pharan. Riding south-west down the Dámah, the party came upon the 'Ayn el-Bada' (بدع), a spring

in a stone-revetted well (?) near the left bank. The strew of broken quartz around it showed an *atelier*; and specimens of scattered fragments, glass and pottery, were added to the collection. The settlement ruins, which the guide called El-Kantarah (the "Bridge" or the "Arch"), lay farther down,

\* The classical term is Abú (or Umm) Zaubah'at, "Father (or mother) of (the demon) Zaubah'ah."

upon a southern influent of the main line of drainage: they were divided into two blocks, one larger than the other. Lieut. Amir then pushed forward by a direct road lying west of that taken by the caravan. The latter travelled up the broad open sole of the Wady Shebaykah (شبيكة, of the "Little Net"), which gives its name to an adjoining mountain: it is the recipient of the Wady Shuwák. The longer road was good, but it occupied the camels 12 hours.

By way of exercitation, we had all laid down from Arab information the bay of Shaghab and Shuwák;\* and nothing could be more incongruous when the sketch-maps came to be compared. This arose from the route following the three sides of a long parallelogram, whose fourth is based upon the Wady Dámah, causing considerable complication. And, the "excursus" ended, we were all convinced that we had made much southing, whereas our farthest point was not more than five miles below the parallel of Zibá (N. lat.  $27^{\circ} 20'$ ).

Leaving the great valley at 6 A.M., we struck up a southern influent, the Wady Shuwák. On the rocky ground of the left bank we passed circles of stones (*Hufrah*, "Water-pits"?) and skirted the low tongue of rock whose folds had supplied us yesterday with drink. Our course zigzagged to the south-east over ground alternately sandy and stony: east of it rose the mountains Abú Shinán (شنان of the "Wild Leek"), and Fujaymah (فجيمه); and west the Jebel Sula' (صلع)† El-Humr.

After 3 hours' marching (=6 miles) we turned up a branch watercourse on the Wady Shuwák's left bank; a "short cut" sensibly avoided by the caravan. The gorge showed at once a total change of formation. Crystallised lime, clays of variegated hues, and large-stoned conglomerates compacted by a hard siliceous paste of dark mauve, as if they contained manganese, painted in fresco, the sides and the floor. Apparently this gully is a favourite with birds. For the first time in Midian we saw the partridge, called here, as in Sinai, "Shinnár"

(شَنَار = Caccabis): the noble species (*C. melanocephala*), common in Abyssinia, is nearly as large as a pheasant, and tastes much like the immigrant from Phasis. Besides this,

\* The latter term, from which Ptolemy borrowed his "Sóaka," is connected with Shákí, i.e., tall, lofty (mountain). "Shaghab" we shall see was formerly "Shaghbā."

† Sullā' would mean a broad hard stone, or a place producing no verdure.

were the quail, the Hajl (Hey's or desert partridge, *Ammoperdix heyi*); the ringdove, the turtle and the fierce little butcher-bird.

Farther on, the path, striking over broken divides and long tracts of stony ground, became rough riding. It is flanked by the usual melancholy monotonous hills of reddish felsite and greenish trap, whose mouldering, slaty and schist-like edges, in places stand upright. Upon the summit of the last Col appeared the ruins of some work, a large square of boulder-stones. After 4 hours' riding (= 10 slow miles), in a general south-eastern direction, lay mapped before us the pink sands, the Daum-trees and fan-palm bush; the arboreous *Asclepias* (El-'Ushr = *Callotropis procera*), and the secular jujubes of fair Wady Shuwák. It is backed by the Jebel el-Sáni' (صانع), the "Mountain of the Maker" (or artificer); that is, the blacksmith. The name derives from a traditional brother of Weyland Smith, who lived and shod animals there in the olden time, possibly before the sixteenth century, when the maritime road was laid out. The block is split into twin heads, *El-Naghar* (نغر)\* being the higher, and lying east of its neighbour *El-Nughayr*. The peaks are excellent landmarks, seen for many a mile; and the Bedawin declare that there is a furnace near the summit.

Shuwák (شواق) which, by Lieut. Amir's dead reckoning, lies in N. lat.  $27^{\circ} 15'$ , can be no other than the Σόακα placed by Ptolemy (VI. vii.) in N. lat.  $26^{\circ} 15'$ . If this be so, we must add an average  $1^{\circ}$  to his latitudes, which elsewhere, also, appear too low. This addition would give:—

Hippus Vicus (Ptol.  $26^{\circ} 40'$ )  $27^{\circ} 40'$ , the exact latitude of El-Muwaylah.

Phoenikon Vicus (Ptol.  $26^{\circ} 20'$ )  $27^{\circ} 20'$ , the latitude of Zibá.

Sálma (Ptol.  $26^{\circ}$ )  $27^{\circ} 20'$ , the Mediterranean village on the Wady Salmá (?).

Badá (Ptol. Badáís,  $25^{\circ} 30'$ )  $26^{\circ} 45' 30''$ .

Marwah, or Abá 'l-Marú (Ptol. Móchoura,  $24^{\circ} 30'$ )  $26^{\circ} 10'$ .

There is nothing violent in this change. On the East African coast Ptolemy's Aromata Promontorium, which can only be Jard Háfún, or "Guardafui," is placed between N. lat.  $5^{\circ}$  and  $7^{\circ}$ , whereas it lies in N. lat.  $11^{\circ} 41' 4''$ .

According to Sprenger ('Alt. Geog.', p. 25), Sóaka and Badáís

\* Naghar signifies a cold-water spring, and Nughayr is its diminutive.

do not fit into any of the Alexandrian's routes; and were connected only with their ports Rhaunathos (Mjirmah?) and Phoenikon Vicus (Zibá?). But both these cities represented important stations, both of agriculture and of mineral industry, on the Nabathæan overland between Leukè Kóme and Petra, a line kept up by the Moslems till Sultan Selim's route superseded it.

I will here describe only the site of Shuwák, consigning to another place\* details concerning its ruins, a subject not strictly geographical. It lies upon a long narrow riverine island, in the broad sandy wady of the same name. The "Thalweg" has evidently shifted again and again; now it hugs the left bank under the Jebel el-Sáni', whilst a smaller branch, on the northern side, is subtended by the stony divide which we have just crossed. At the city the trend of the valley is from north-east to south-west, and the altitude is about 1700 feet (aner. 28·28, the mean of 6 obs.). The head still shows the sandstone castellations of the Hismá. Looking down stream, beyond the low dark hills that divide the basin from the adjoining southern wady, we see the tall grey heads of Jebel Zigláb (زجلاب), and of the Shahbá Gámirah

(شهبأ جامرة), the "ashen-coloured (peak) of Jámirah," the P. N. of a valley. Both gleam white by the side of the gloomy traps; and they mark the granitic region, lying south and seaward of the more modern plutonic rocks.

At Shuwák we allowed our camels, but not ourselves, a day of rest. The ruins are in the usual melancholy state, much like the broken heaps and cairns which are found in the Nejed or "South Country." Traces of solid walls, forming huge parallelograms, are divided by tumuli of loose friable soil efflorescing with salt—the miniatures of what are seen at Babylon, Nineveh and Troy. The arrangements for smelting, and for water-supply, furnaces, wells and cisterns, barrages and aqueducts, appear to have been on a large scale. One conduit, built of untrimmed stone, and channelled with rough cement overlying a finer concrete, can be traced for a mile and a quarter along the left bank. The circular furnaces, measuring some 2 feet in diameter, were built of fire-brick; and of the Hismá sandstone, which moulds itself into a natural open *lateritium*. We dug into several of them, but so careful had been the workmen, or perhaps the "treasure-seeker," that not the smallest bit of metal remained—nothing was found save ashes,

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\* 'The Land of Midian (Revisited),' chap. xi.

pottery and stones. Perhaps our most interesting discovery was of the catacombs, proving a civilisation analogous to that of Magháir Shu'ayb, but ruder far, because more distant from the ethnic centre.

We left Shuwák considerably perplexed by what it had shown us. The city proper is  $1\frac{1}{2}$  mile long; and it could hardly have lodged less than 20,000 to 25,000 souls. The evidences of immense labour were the more surprising when compared with the utter absence of what we call civilisation. Not a coin, not even a bit of glass, had been picked up. The Greek and Latin inscriptions of the Hauranic cities declare their origin. These Midianitish ruins, absolutely analphabetic, refuse a single hint concerning the mysterious race which here lived and worked, and worked so nobly. Again, who were the Moslems who succeeded them in a later day, when the Hajj-Caravan, some  $3\frac{1}{2}$  centuries ago, ceased to march by this road? How is it that the annalists say nothing of them? that not a vestige of tradition remains concerning any race save the Nazarene?

*March 2nd.*—From Shuwák to the Wady Dámah are two roads. The direct turns to the north-west: the other, which passes the ruins of El-Shaghab, forms two legs, due south and south-west. Setting out, at 6 A.M., down the left or southern side of the Shuwák Valley, we passed some immense basements of constructions lying about a mile below our camp; the total length could not have been less than 4 miles. One is a wall of over 1000 yards, ending in what appears to be a square cistern, 48 paces each way. On the east rose the Jebel el-Wasaydah (وَيْدَة), fronting the Jebel el-Wasaydát (وَيْدَات). We then left the Shuwák Valley to the right, and struck over a rough and stony divide, with a narrow pass formed by the Jebel Hashím on the north, and the Jebel Ghuráb on the south. The pass was marked by Bedawi tombs, garnished with the usual rags and tatters. Beyond the pass, quartz once more appeared in large quantities.

After marching 2 hours (=7 miles) we saw uniform heaps to the left; and another 30 minutes showed us a range of boulder-circled pits on the right; their clay soles were of brighter green, and the Arabs called them *Hufrah* (حَفْرَة), the "artificial," opposed to *Temáil el-má* (تَمَائِل), "natural water-holes." We are now in another hydrographic basin; the southernmost yet visited. This Wady el-Shaghab flows south-



westward to the Wady Aznab (the "fat"), whose embouchure we shall pass on the way southwards.

After a total of 3 hours (= 10 miles), we sighted the large and important remains of Shaghab (شغب). It is probably included by Ptolemy under the name Sóaka; and it is evidently the Shaghba, which the geographer Yákút (iii. 302) places one day's journey from Badā. The ruins of Shaghab are built upon more complicated ground than those of Shuwák. The Wady Shaghab, flowing southwards, here spreads out into a broad bulge or basin; it contains rude Arab wells; and its characteristic rock is the mauve-coloured conglomerate before noticed. Looking down-stream we see a "gate," formed by the meeting of two rocky tongue-tips, both showing large works: beyond these narrows nothing is visible. The mass of the city lays on the left bank, where a high and artificial-looking *remblai* of earth masks the mouth of an influent from the east, the Wady el-Aslah (الأسل), or of the "Kali Plant," which, with the Wady Shaghab, feeds the Aznab. It drains the Jebels Aslah and Zigláb, the cones of pale granite visible from Shuwák; and the old settlement stood *à cheval* upon its broad lower course. Slightly east of north the twin peaks Naghar and Nughayr, combining to form the "Mountain of the Maker," tower profiled in the shape of a huge pyramid. A little north of west springs, also in profile, the great Shárr of El-Muwaylah; no longer a ridge, but a tall and portly block. Lastly, a regular ascent, the Magráh el-Wághir (of "Fretting") fronts the city, sloping up to the w.n.w.; and disclosing a view of the Jibál el-Tihámah. This broad incline was, three centuries ago, the route of the Hajj-Caravan.

The ruins, which are not a quarter the size of Shuwák, show the usual succession of huge parallelograms. The only peculiarity is one of the many aqueducts which, after Greek, as opposed to Roman fashion, has been run underground to pierce a hillock. Near the remains of a fort (?) we found heaps of land-shells: they are rare in this region, and during our four months' march we secured only two species. Shaghab removed some of the difficulties which had perplexed us at Shuwák and elsewhere. In the northern country signs of metal-working, which was mostly confined to the wadys, have been generally obliterated, either washed away or sanded over. Here the industry revealed itself without mistake. The furnaces were few; but around each are long heaps of *negro* and copper-green quartz, freshly fractured; while broken hand-

mills of basalt and lava, different from the rub-stones and the mortars of softer substance, told their own tale.

At Shaghab then, the metalliferous rock, brought from the adjacent mountains, was crushed and probably transported for washing and roasting to Shuwák, where water, the prime necessary, abounded. If in early days the two or rather three settlements formed one, their south end would have been the head-quarters of the wealthier classes. Hence the Bedawin always give it precedence—"Shaghab wa Shuwák." Moreover, we remarked a better style of building in the former; and we picked up glass as well as pottery.

The glass fragments found in Midian generally are of two distinct kinds. The modern is the thick bottle-green and blueish material which Hebron still produces. The ancient, procured by digging, is so much degraded by damp that iridescence has supplanted the original texture. Amongst the Greeks of the classical age there were many varieties of colour. The deep-green or black-brown were made from the obsidians of Thera, Mylos, &c., treated with soda, potash and oxide of lead to make it flow readily. The opaque yellow was alumina mixed with iron oxide; and oxide of copper or, possibly, malachite, was added to form the blue variety.

IV. *The return to El-Muwaylah viâ Zibá.*—Leaving Lieut. Amir to map and plan the ruins, we followed the caravan up the Magráh el-Wághir, the long divide whose film of forest-trees, each separated by a few yards from its neighbour, somewhat reminded me of the Anti-Libanus about El-Kunaytarah. There, however, thick-leaved terebinths and holm-oaks, here thorny acacias and mimosas form the staple. On our right stood the dull bare block Jebel Muwayrib (مويرب); and, farther north, the Jibál Abú Tínah (طينه, "of clay"). Behind these two the tall Jebel Tulayh (طلح of the "little Talh-

thorn") buttressed the right (northern) bank of the Wady Dámah; and, still farther, stained faint blue by distance, rose the familiar Tihámah range, a ridge now broken into half-a-dozen blocks. About the third mile we passed, on the left, ruins of long walls, memorial stones, and signs of Arab "Wasm." I had ordered the camp to be pitched upon the Tuwayl el-Súk; despite which, in 1 hour 15 minutes (= 4 miles), and a total of 4 hours 15 minutes (= 14 miles), we found the tents standing some 3 miles short of it, on a bleak ugly and waterless ridge of the Wághir (واغر). The Shayks swore by Allah that this

was the veritable Tuwayl; and a Bedawi, who knew where water lay in the neighbourhood, refused to show it without the preliminary "bakhshish."

*March 3rd.*—At 6 A.M. we set out down the right bank of the Wady el-Khandaki, which runs north with westing. Beyond its depression lay the foot-hills of gloomy trap leading to the Jebel el-Raydán (ريدان); the latter is a typical granitic form,

a short demipique-saddle with inwards-sloping pommel. The Tuwayl el-Súk shows nothing but an open and windy flat, where the Hajj-Caravan used to camp; the Hamrá el-Tuwayl, an adjoining ridge, is scattered with spalled quartz, "Wasm," and memorial stones. Here the principal formation is the mauve-coloured conglomerate.

Beginning from the south, the left bank is composed of the Jebels el Wa'r, Haraymal (حريميل, so called from the *Peganum*, a perfumed shrub), Marwah and El-Khandaki. On the right or east the broad valley is bounded by the Jebels el-Zamá (ظما, of "being thirsty"), Umm Ramays\* (روميث), and El-Nábi'.

After riding 2 hours 30 minutes (= 9 miles) to the north, with westing (300° mag.), we came unexpectedly upon a large and curious ruin backed by the Wady Dámah;† a pair of parallel walls, some 35 feet apart, and about 1000 yards in length, formed the chief feature. For want of a better name I called this old settlement *Kharábát* (ruins of) *el-Khandaki*, and greatly regretted that we had not time enough to march down the whole line of the Dámah.

Half an hour more placed us at the junction of the Wadys el-Khandaki and Dámah. Here is a well, the "Bir," or "Máyet" el-Nábi' (ناعب), the "Bursting or Overflowing"; and the "Hufráhs" of the Arabs everywhere supply sweet water. The characteristic vegetation is the hardy tamarisk, whose grey-green clumps shelter goats, sheep and camels. Our mules now revel on green-meat; *Aristida*-grass, *Panicum*, *Hordeum* (*murinum*), and *Bromus* of several varieties. In front rise the twin granite-peaks of the Jebel Mutadán (مُتَدَان,

\* The dim. form of Rims, a tree and a kind of forage eaten by camels. Lane (*sub voce*) describes it as resembling a dwarf tamarisk. Like the Ghazá plant, it is used for making alkali.

† See 'The Land of Midian (Revisited),' chap. xii.

i.e. "near or adjacent"), one with a stepped side like a pyramid lacking its casing. They are separated from the Wady Dámah by a rough and stony divide; and ruins with furnaces are reported to be found in their wady, which feeds the great Wady 'Amúd. From the sea they also show two ridges of grey-white granite.

At 11 A.M., after riding 5 hours (= 16 to 17 miles), we halted near a water called El-Ziyayb (زيب): slightly brackish, but much relished by our animals. It lies opposite the Jebel Tulayh on the north bank. We then resumed our way towards a lone peak, the Khang (خنج) el-Karín — these South Midian names have a truly barbarous twang. Sundry bends in the bed occupied 1 hour (= 3 miles). We then left the Wady Dámah, and turned up a short broad Fiumara, the Khuraym (حريم)\*

el-Asírah. The Wady Sa'lúwwah to the left showed a barley-field, the property of some exceptionally industrious Bedawi of the Jeráfin-Huwaytát clan. On our right rose a block of syenite ruddy with orthose; the surface was formed by rounded lumps and twisted finials. We rode two more hours (= 6 miles), a total of 7 hours (= 22 miles), much to the disgust of the camel-men; and lastly we camped at the Jayb el-Sa'lúwwah, also known as El-Kutayyifah (قطيفه).† This part of the divide is near a fold in the syenitic mountain, the Sha'b el-Burayrj (بريرج), whose stony flanks supply fresh rain-water from the rock.

In the western hills that bound the broad slope, the remains of a made road lead to an *atelier*, where large quantities of quartz had been broken *in situ*. Some specimens wore a light bluish tinge, as if stained by cobalt, a metal found in several slags; and there were veins of amethystine quartz-crystals nestling in their agaty beds: the engineer suspected that they were coloured by chlorure of silver (?). The *filons* and *filets* cut the granite in all directions; and the fiery action of frequent trap-dykes had torn the ground-stone to tatters. Here a Bedawi had volunteered a grand account of ruins and inscrip-

\* Khurm, in the dictionary, is the brow or projecting summit of a mountain; the Arabs of Midian seem to denote by it a hollow, or cavity.

† Meaning the "little Katifah," mantle or folded garment.

tions to be seen on our next day's march. We took abundant trouble to visit all the places, and found simply nothing. The guides also reported, when too late, that to the w.s.w. of El-Kutayyifah lies a Nakb called Aba'l-Marwah, the "Father of Quartz," whose waters flow *viâ* the Mutadân to the Wady 'Amúd.

*March. 4th.*—From this divide two roads lead to the ruins of Umm Ámil. One goes direct, crossing an ugly pass; the other avoids it by a considerable *détour*, *viâ* the circuitous Wady Ruways (رويث). At 6 A.M. we struck westwards down

a slope some 5 miles long; and then ascended a wady bounded on either side by a conspicuous red hill. A few minutes led us up the Fiumara, whose bed, cumbered with boulders, had cut deep below the stiff clayey *Jarf* ("raised banks"): the ascent presently placed us on a broad open plain, some 2100 feet above the sea-level (aner. 28·85), and forming a water-parting. On the left a square stone work seemed to have been intended for defence.

A few furlongs down the broad and smooth Wady Ruways brought us to a halt near a large *atelier* on the left side. Its sole peculiarity was the beauty of the handmills, made of the hardest and finest grey granite. We then struck over a stony divide to the left, separating the Wadys Ruways and Umm Ámil. Here lay signs of another Mashghal (*atelier*). In front rose a fine landmark, the Khurm (top) el-Badariyyah (خرم البدرية). A tolerable track led to the summit of the

Col at 9.45 A.M.; and a vile descent presently landed us in the Wady Umm Ámil. The left bank of the hideous narrow gorge showed a line of water-pits, attributed to the Mutakaddimín—the ancients. Crossing the torrent-gully, we left on its right bank the foundations of large works. After a total ride of 4 hours (= 13 miles), and a morning spent in chasing the wild-geese, we halted opposite three couthless heaps of rolled stones, surrounded by fine quartz. This "town" had been grandiosely described to the first Expedition by the citizens of Zibá, who declared the distance to be 4 hours instead of 7 hours 30 minutes. The Bedawin, on the other hand, assured us that the stages, Shaghab—Umm Ámil and Umm Ámil—Zibá, were the same measure; when the former occupied 12 hours 15 minutes, and the latter 7 hours 30 minutes. The Sayyid suggested that the name "Mother of the (fellow) Workman" is a corruption of Mu'ámil (one who labours with others). I would also conjecture

that here the slave-miners were stationed; old Zibá being the masters' abode. At the coast-town we found some specimens of fine and heavy red copper, which had been dug out of a ruined furnace in Umm Ámil.

At noon we rode down the ugly rocky watercourse, both of whose banks showed long lines of razed and broken building. Presently, crossing a divide marked by two stone-heaps, we fell into the broader but equally unpicturesque Wady Salmá (سالم).<sup>\*</sup> It lies in about the parallel of Zibá (N. lat.  $27^{\circ} 20'$ ); and we must add  $1^{\circ} 20'$ , instead of  $1^{\circ}$ , if we would connect it with Ptolemy's Mesogaian *κώμη*, called *Σάλμα* (VI. vii.). Wady Salmá is the smallest, and the northernmost of the three basins which we have just visited; the central being the Wady Dámah, and the southern Wady Shaghab-Aslah-Aznab.

We presently passed on the left bank the debouchure of the Wady Ruways. After a hot ride of 1 hour 45 minutes (= 6 miles), and a total of 5 hours 45 minutes (= 19 miles), down the dull line, we camped on the floor of fine sands, hemmed in by tall masses of monotonous trap. The adjacent scatter of Arab wells in the bed is known as the Má el-Bad'fah (بديعه the "Water of Wonders"). I carefully asked about ruins in the neighbourhood, and we climbed the torrent-sides to command a bird's-eye view of the adjacent hill-chaos. According to the guides, there are no remains of the "old ones" nearer than those of Umm Ámil.

*March 5th.*—We set out at 5.45 A.M. down the Wady Salmá, and half an hour showed us its lower course constricted to a mere gorge by two opposite rocks. On the left bank lies a group of Arab graves, which may have taken the place of some ancient *atelier*. The right bank here receives the Wady Haráímil, as the broad-speaking Bedawin pronounce "Haray-mal (حرميل the "Little Peganum");" and we struck up the Shayín (شطين)† el-Haraymal, or (Water?) parting of the Haraymal. Then we fell into the Wady Abá Rikayy (of Wells),‡ remarkable only for the quantity of its brackish water. Below, it takes the name of Wady Kifáfi (not Kafafa), and discharges into the sea north of the Wady Salmá (Ad. Chart,

<sup>\*</sup> Salmá (ending with the Ya-alif) is the name of a tribe, a woman, and a mountain, also of the south wind.

† Shayín, the root, means opposition; hence Shayín = Satan.

‡ Rakiy, in pure Arabic, the plur. of Rakiyat, a (clean) well or water-pit.

27° 18'). It has been erroneously connected with the latter, as in Niebuhr's "*Salma ukesafe*," which Sprenger (p. 24) corrects to *Selmâ wa Kafâfa*.\* A third divide to the north led along the eastern flank of the Jebel Abú Rîsh, which is visible from the offing; and, reaching the Col, we saw the Red Sea about Zibá.

The track then descends into the Wady Sidrah (of the Single Lotus-tree), whose left bank is formed by the Safrá Zibá, the "yellow (hill) of Zibá," a name which well describes its citron-coloured complexion. Here we found only blue quartz stained with carbonate of copper. The "Valley of the (one) Zizyphus," after narrowing to a stony gate, suddenly flares out as it falls into the Wady Zibá; and we reached the far-famed wells after 4 hours (=11 miles). In my vol. i. p. 307, I confounded the "Sultan's Wells," the Birket, and the "Eunuch's Grave," in one glorious blunder.† The flat surrounding the cove-head is remarkably well grown with the two common varieties of palms, the Date and the Daum: it still deserves the title "*Phoeníkon Kóme*." I have already protested (vol. i. chap. xi.) against the derivation of the word, and the identification with "Hippos," proposed by my learned friend Sprenger ('*Alt. Geog.*', p. 24). His theory was probably suggested by Yákút (iii. 464), who writes *Dhabbá*, and places the post 70 miles from Badá. The people universally spell the word with a zád (ضبا); and never with a

zá (ظ) which would make it signify "gazelles;" and lastly, the terminal aspirate (*e.g.* Zibáh) is unknown to them. Older names are Bir el-Sultáni, and Kabr el-Tawáshí, for which see the Haji's route. The single well of Sultan Selim (?) has now grown to four, all large and stone-lined.

We found the best pitching-ground to be on the site of old Zibá, a strip of sand sheltered by the tall sea-cliff, and forming the northern shore of the inner cove, behind the new town. Here the stones, buried for ages under the sand, are now dug up to build its successor. This second visit made me think better of the settlement, and of the harbour, concerning which Wellsted (ii. 181) wrote, "At Sherm Dhobá the anchorage is small and inconvenient, and could only be made available for boats or small vessels." Dredging the sandbar, and cutting the soft sandstone, will give excellent shelter and, some say, a depth

\* For the derivation of the name see the Route-line of Haji Khalífah at the end of this paper.

† See '*The Land of Midian (Revisited)*,' chap. xii., and the Route-line at the end of this paper.

of 17 fathoms. The settlement is far superior, especially as regards potable water, to El-Muwaylah; it exports charcoal in large quantities, and it drives a thriving business with the Bedawin. There are beginnings of a pier, and a mosque is building. The fish is excellent and abundant; lobsters are caught by night near the reefs, and oysters in the bay when the tide is out. Shoes are to be bought:\* as at El-'Akabah, "Hashísh" may be found in any quantity, but no "'Raki;" and yet one of the chief traders is a Copt, who finds it convenient to become a Moslem.

Some of our first inquiries were concerning the Jebel el-Fayrúz ("Turquoise hill"). I had seen during our previous expedition a splendid specimen of this gem; and all the coast-people described the *lapis Pharanites* of Zibá as the best they knew. The immediate result of questioning was a general denial that anything of the kind existed. Furayj, however, engaged as guide an old Bedawi, Sulaym el-Makrafi; and his son was sent on to gather all the "Fayrúz" he could find. Here also we collected notices concerning the ruin "El-M'jirmah," which has been identified with the *Παννάθου κώμη* placed by Ptolemy in N. lat. 25° 40'. The site is said to be a branch valley of the Wady Azlam, the first of the three pilgrim-marches between Zibá and El-Wijh. This watercourse shows, above the modern Hajj-station, the ruins of a fort built by Sultan Selim. Wellsted also mentions (ii. 183) a castle lying three miles inland. The people describe M'jirmah as an ancient gold mine(?); and the house-foundations and a "well with steps" still, they say, remain. Our day of rest (March 6) ended at 7 P.M. with a heavy storm of wind and rain from the north.

*March 7th.*—The caravan marched straight northwards along the shore, by the Hajj-road, to its camping-ground in 2 hours (= 5 miles). Meanwhile M. Marie and I, accompanied by Furayj and the old Bedawi, set off for the turquoise-mine. At 6 A.M., crossing the broad pilgrim-track, we struck eastward at a place where the secondary gypsum subtends the coralline *fataise*. After 45 minutes we traversed the Wady Zabakán (ضحكان), the southernmost pass over the Shárr (proper); and presently we ascended a branch that falls into the right bank. As we advanced it became a rock-walled stone-soled tunnel, very interesting after such dull flat breadths as the Wady Salmá. The overfalls of rock, and the thorn-trees, which in

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\* See 'The Land of Midian (Revisited),' chap. xii.



places occupy singly the whole bed, necessitated, as usual in such narrows, frequent zigzags up and down the rocky banks. After a number of divides, we entered the Wady Hashshah, wide and good for riding; and, at 8.30 A.M., we passed into the Wady Umm Jirmah.

Here immense quantities of broken quartz, distinguished by its pretty pink colour, denoted the Mashghal (*atelier*). The rock appeared in large ramifications, mostly striking east-west, and in little *pitons* dotting the wady's sole and sides. After another half-hour we dismounted at the watershed of the Wady el-Ghál (غال),\* where the greybeard guide lost no time in losing

his head. The Jebel el-Ghál, whose folds fall into its water-course, is a detached block rising nearly due south of southern "Sharp Peak" in the Admiralty Chart; while the mouth of the Ghál Cove, breaking the sea-cliff, bears 270° (mag.) from the summit. It lies 3 hours (= 10 miles) N.N.E. of Zibá, and it rises 350 feet above the sea-level (aner. 29.75). The mass is composed of porphyritic trap, and of the hardest felspars, veined with chocolate-coloured granite, the latter being the true gangue. We failed to find the precious stone, and accordingly I determined upon another attempt.

After building a "stone man" on the finial of the Jebel el-Ghál, we remounted and struck seawards. Some ugly divides led us, in half an hour, to a broad Fiumara well-grown with palm-bush, the veritable Wady el-Ghál. From this point a total of 1 hour 15 minutes (= 4 miles) to the west, and a grand total of 4 hours 15 minutes (= 14 miles), placed us in camp. It had been pitched at the Mahattat el-Ghál, on the north bank, where the "winter-torrent," falling into the sea, has cut a cove in the cliff.

Here the best of news awaited us. Lieut. Yusuf, who this morning had rejoined the Expedition, reported that all my requests had been granted; that our friend the *Sinnár* was to take the place of the lively *Mukhbir*, and that rations and stores were on the way. I felt truly grateful to his Highness and to the Prince Minister for the gracious interest they had taken in the Expedition.

During the day a Jeráfin Bedawi, Selím ibn Musallim, brought in scorïæ of copper and iron; and, on the morrow, I sent him as guide to Lieut. Yusuf, with an escort of two soldiers and eight quarrymen on seven camels. After three

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\* Gháll means the ground producing the thorny Salam-tree; it is also a name of the large Arabian lizard.

days' absence (March 8-10), the officer rejoined us and reported as follows:—

Leaving the Mahattat el-Ghál, he struck up its watercourse, and then turned southwards into the long Wady Umm Jirmah. A ride of  $7\frac{1}{2}$  miles ( $=5\frac{3}{4}$  direct) placed him upon the Jebel el-Fayrúz, a rounded eminence of no great height, showing many signs of work, especially 3 or 4 cuttings some 20 inches deep.

Here a hillock to the north-west supplied the scorix before mentioned. Lieut. Yusuf blasted the chocolate-coloured quartzose rock in four places, filled as many sacks, and made the pilgrim-road in the Wady el-Mu'arrash (معرش), leaving to the

left its red block, the "Hamrá el-Mu'arrash." His specimens were very satisfactory, except to the learned geologists of the citadel, Cairo, who pronounced them to be carbonate of copper. They evidently ignored the difference between silicates and carbonates.

I made many inquiries, but could hear nothing, of the "Jamast." The dictionaries describe it as a blue gem (turquoise?) found near El-Medinah. It is made into cups (for 'Raki), which "have the singular property of preventing those who drink out of them from being intoxicated, and also of causing pleasant dreams." Meninski (*sub voce*) writes Gemset, makes the colour violet or red, and derives it from diggings distant three marches from the city of the Apostle.

*March 8th.*—Our southern journey ended with a dull ride along the Hajj-road northwards. Passing the creek, Abú Sharír, which, like many upon this coast, is rendered futile by a wall of coral-reef, we threaded a long flat, and in 2 hours ( $=7$  miles) we entered a valley where the Secondary formation again showed its débris. Here is the Manattat el-Husán (the "Stallion's Leap"), a large boulder showing hoof-prints. The horse, "El-Mashhúr," lived in the Days of Ignorance, others add when the Beni 'Ukbah were warring with the Baliyy. It temporarily saved its master's life by alighting upon this boulder, which then filled the pass. A similar story will be found in Palmer's 'Desert of the Exodus' (p. 42); and both show that a noble breed has existed where nothing but a donkey can now live. Perhaps, also, the Midianite tradition may descend from a source which, still older, named the Ἰππος κόμμη.

We then fell into the Wady Jibbah, passed the Jebel el-Kibrít, examined M. Philipin's work, and, led over a vile and very long "short-cut," found ourselves once more on board the *Mukhbir*.

The following is a synopsis of stations and dates:—

1.	Feb. 19.	El-Muwaylah to the Safh .. ..	4 h. 15 m. = 10 slow miles.
2.	" 20.	To the Sayl Wady el-Jimm .. ..	4 h. = 10½ "
3.	" 21.	" El-Nagwah .. ..	4 h. 10 m. = 11 "
4.	" 22.	" Miyáh el-Rikáb .. ..	5 h. 15 m. = 13½ "
5.	" 23.	" Ras Wady Sadr .. ..	3 h. = 9½ "
6.	" 24.	Up the Pass to the Hismá .. ..	1 h. 30 m. = 3 "
7.	" 25.	To the Jayb el-Khuraytat .. ..	2 h. 15 m. = 5½ "
8.	" 26.	" the Majrá el-Ruways .. ..	4 h. = 11 "
9.	" 27.	" Wady Dámah .. ..	5 h. 45 m. = 17 "
10.	" 28.	" Ruins of Shuwák .. ..	4 h. = 10 "
11.	Mar. 2.	Shaghab and Magráh el-Waghír .. ..	4 h. 15 m. = 14 "
12.	" 3.	" El-Kutayyifah .. ..	7 h. = 22 "
13.	" 4.	" Umm Ámil and Má el-Badí'ah .. ..	5 h. 45 m. = 19 "
14.	" 5.	" Zibá .. ..	4 h. = 11 "
15.	" 7.	" J. and W. El-Ghál .. ..	4 h. 15 m. = 14 "
16.	" 8.	" Sharm Yáharr .. ..	4 h. 15 m. = 16½ "
Grand total .. ..			67 h. 40 m. = 197½ "

Here my distances are somewhat understated, as they would give a rate of less than 3 miles (statute) per hour. Lieut. Amir's estimates (222 miles), laid down upon the map, represent a fraction more.

V. *Ascent of the Shárr Mountain.*—For long months the Jebel Shárr, the grand block which backs El-Muwaylah, had haunted us, starting up unexpectedly in all directions with its towering heads, that shifted shape and colour from every angle and with each successive change of weather. We could hardly leave unexplored the classical "Hippos Mons," the Moslem's *El-Ishárah* (the "Landmark"), and the "Bullock's Horns" of the prosaic British navigator (Irwin, 1777); while the few vacant days, caused by the non-arrival of the *Sinnár*, offered an excellent opportunity for studying the "Alpine ranges" of Maritime Midian. Niebuhr (*Flora Ægypt.-Arabica*) justly says of this coast farther south, "Altitudine prodigiosa et prærupta eminent montes, haud pauci sublimem atmosphærae regionem attigentes . . . liceat montes istos *Alpes* nominare vel cum *Alpibus* conferre." Be it so! but, as Sir Frederick Henniker remarked, they are "Alps unclothed."

The stony heights beyond El-Muwaylah contain, they said, wells and water in abundance, with palms, remains of furnaces, and other attractions. Every gun was brought into requisition by tales of leopards and ibex, the latter attaining the size of bullocks (!), and occasionally finding their way to the Fort. I was anxious to collect specimens of botany and natural history from an altitude hitherto unreachd by any traveller in this part of Western Arabia, and, lastly, there was geography as well as mineralogy to be done.

The Hydrographic Chart gives the mountain a maximum of 9000 feet, evidently a clerical error often repeated. Really these Admiralty gentlemen are too incurious! Their carelessness has imposed upon so careful a workman as the late Lieut. Raper, p. 527, 'The Practice of Navigation,' sixth edition. Wellsted, who surveyed the Shárr, observes (ii. 176), "The height of the most elevated peak was found to be 6500 feet, and it obtained from us the appellation of "Mowilahh High Peak," whereas there are native names for every head. We had been convinced that the smaller is the correct measure by our view from the Hismá plateau, 3800 feet above sea-level. Again, the form, the size, and the inclination of this noble *massif* are wrongly laid down by the Hydrographers. 'It is a compact block, everywhere rising abruptly from low and sandy watercourses, and completely detached from its neighbours by the broad wadys, the Surr to the north, and southwards the Kuwayd and the Zahakán. The huge long-oval prism measures  $19\frac{1}{2}$  miles by 5 ( $=97\frac{1}{2}$  square miles of area), and its lay is  $320^\circ$  (mag.), thus deflected  $40^\circ$  westward of the magnetic north. The general appearance, seen in profile from the west, is a central apex, with two others on each side, tossed, as it were, to the north and south, and turning their backs upon one another.

Moreover, the chart assigns to its "Mount Mowilah" only two great culminations—"Sharp Peak, 6330 feet," to the north, and "High Peak, 9000," south of it. Some careless confusion has also introduced a second "Sharp Peak" much farther north, with exactly the same altitude (6330 feet): the latter is probably the Jebel el-Sháti (شاطى), in the Urnub block.

The surveyors doubtless found difficulty in obtaining the Bedawi names for the several features, which are unknown to the citizens of the coast, but they might easily have consulted the only authorities, the Jeráfin-Huwaytát, who graze their flocks and herds on and around the mountain. As usual in Arabia, the four several main "horns" are called after the Fiumaras that drain them. The northernmost is the Abú Gusayb (Kusayb), or Ras el-Gusayb (قصب), the "Little Reed," a unity composed of a single block and of three knobs in a knot. The tallest of the latter, especially when viewed from the south, resembles an erect and reflexed thumb; hence our "Sharp Peak." Follows Umm el-Furút (فروط), the "Mother of Plenty" (or "Superiority"), a mural crest, a quoin-shaped wall, clinging to the south. The face, perpendicular where it

looks seawards, bears a succession of scars, upright gashes, the work of wind and weather; and the body which supports it is a slope disposed at the natural angle. An "innominatus," with the semblance of a similar quoin, is separated by a deep Col, apparently a torrent-bed, from a huge *Beco de papagaio*,—the "Parrot's Bill," so common in the Brazil. This is the Abú Shenázir (شاذر),\* or Shaykhánib (شيخانيب), the "Father of Columns,"† the "High Peak" of the Ad. Chart. It is the most remarkable feature of the sea-façade, even when it conceals the pair of towering pillars that show conspicuously to the north and south. From the beak-shaped apex the range begins to decline and fall to the south. There is little to notice in the fourth horn, whose unimportant items, the Ras Lahyánah (لحيانه),‡ the Jebel Malih, and the Umm Gisir (جسر), end the wall. Each has its huge white wady, striping the country in alternation with the normal dark-brown divides, and trending coastwards in the usual network.§

The material of the four crests is the ordinary grey granite, lumpy masses of immense size, rounded off by scaling and degradation; all chasms and naked columns. Here and there a sheet burnished by the action of cataracts, and a slide trickling with water, unseen in the shade, and flashing like crystal in the sun, break its uniformity. The granite, however, is a mere mask or excrescence, being everywhere based upon, and backed by, the red felsite and the green plutonic traps which have enveloped it. And the prism has no easy slope, eastward or inland, as a first glance suggests: nor is it the sea-wall of a great plateau. It falls almost as abruptly to the east as to the west; the country behind it being a perspective of high and low hills, lines of dark rock divided from one another by wadys of exaggerated size. Only one of these minor heights, the Jebel el-Sahhára (سحارة), looks down

upon the sea, rising between the Dibbagh-Kh'shabríyyah block to the north, and the Shárr to the south. Beyond the broken eastern ground the ruddy Hismá and the gloomy Harrah form the fitting horizon.

The following section will treat mainly of the routes along

\* "Shanzarat" in dictionary Arabic means ruggedness, or the being rugged.

† And, as if two names did not suffice, it has a third, *Ras el-Hurayz* (حويض), of the "Little Cistern").

‡ Lihyán is a gully, gutter, or furrow made by a torrent.

§ On the return march (March 18th) we crossed the Wadys Umm Gisir Malih, Lahyánah, Bayzá, and Ummayyaz el-Bayzá.

and around the Shárr. I have published elsewhere \* a description of the Monarch of Midianite mountains in his picturesque form.

*March 13th.*—The camels came late from El-Muwaylah; and it was nearly 9 A.M. before we left the *Mukhbir*, landed at the head of Sharm Yáharr, and marched up the short Wady Harr. This watercourse drains the tallest of the hillocky sub-ranges, the red rock "Hamrá el-Maysarah" ("of the Maysar plant"?). Our guides, two sturdy mountaineers of the Jerafin-Huwaytát, then struck eastward over a short divide to the Wady Sanawiyyah. It is a vulgar valley with a novelty, the Tamrat Faraj. This buttress of brick-coloured boulders, blocking the right bank, has or is said to have the memnonic property of emitting sounds—*yarinn* (يرن) is the Bedawi word. The valley-sides of dark trap are striped with white veins of heat-altered argile, the sole with black magnetic sand; and patches of the bed were buttercup yellow with the dandelion (حندان), the *Cytisus* and the "Zaram" (ضرم = *Panicum turgidum*), loved by camels. Their jaundiced hue contrasted vividly with the purple and mauve blossoms of the bugloss (El-Kahlá كحلا), the blue flowerets of the lavandula (El-Zaytí) and the delicate green of the useless asphodel (El-Borag بورج)

which now gave an aspect of verdure to the slopes. Although the rise was inconsiderable, the importance of the vegetation palpably decreased as we advanced inland.

In 1 hour 30 minutes (=4 miles), we reached the wady-head, and wasted a couple of hours (10.15 A.M.—12.30 P.M.) awaiting the caravan. The path then struck over a stony waterparting, with the "Hamrá" to the left or north; and, on the other side, the familiar Jebel el-Mu'arrash. The latter ends in an isolated peak, Jebel Gharghúr (غرغور); which, on our return, was mistaken for the Sulphur Hill of Jibbah. We then renewed acquaintance with the Wady el-Bayzá ("White Nullah"); here it is a long, broad and tree-dotted bed, glaring withal, and subtending this section of the Shárr's sea-facing base. We reached, after 1 hour 15 minutes (=4 miles) and a total of  $2\frac{3}{4}$  hours (=8 miles), the Jibál el-Kawáim, or "The Perpendiculars," one of the features which the Bedawin picturesquely

\* 'The Land of Midian (Revisited),' chap. xiii.

call the *Aulád el-Shárr* ("Sons of the Shárr"). The three heads project westwards from the Umm Furút Peak, and then trending northwards, form a picturesque lateral valley known as Wady el-Káimah. The profile of No. 3 peak, the Káimat Abú Ráki', shows a snub-nosed face in a judicial wig. The view was charming; especially so long as lasted "The pathos of the after-glow."

Our camping-ground was the Safh el-Shárr ("Plain of the Shárr"); and the lateral valley was strewn with quartzes, white, pink and deep-slaty blue, which the guides derived from a "Jebel el-Marú." The night was still and warmed by the radiation of heat from the huge rock-range behind us. Dew fell like thin rain; we now remarked this meteor for the first time; and the guides declared that this effect of humid atmosphere would last during the next three months. Wallin, writing from the Hismá, in February (26th, 1848), notices the nightly dew, which he had observed in the deserts near the Nile, and on the Red Sea coast, but never in Arabia.\* Thus he explains the instances of chest disease which, very rare amongst the Bedawin of the interior, are found on the north-western edge of El-Nejd.

*March 14th.*—At 6 A.M. we ascended, by a long leg to the south-east, the Wady el-Káimah in search of the Quartz Hill. An abrupt turn to the north-east thence led over rough ground, the lower folds of the Umm Furút, where a great granite gorge, the Nakb Abu Sha'r, ran up to a depression in the dorsum, an apparently practicable Col. Suddenly the rocks assumed the strangest hues and forms. The quartz, slaty-blue and black below, was here spotted and streaked with a dull dead white, as though stained by the droppings of myriad birds: there it lay veined and marbled with the most vivid of rainbow-colours, reds and purples, greens and yellows. Evident signs of work were remarked in a made road, running up to the "Jebel el-Marú" (proper), whose strike is  $38^{\circ}$  (mag.), and whose dip is westward. I have elsewhere† described this *arête*, this cockscomb of snowy quartz, some 60 feet high by 45 of basal breadth.

Returning to our old camping-ground, having ridden 3 hours 30 minutes (=9 miles), we crossed a divide to the Wady el-Málihah (the "Salt Valley"); and another to the Wady el-Kusayb, where a few formless heaps represented the ruins so grandly reported to us (February 19th). We encamped after 1 hour 30 minutes (=4½ miles), making a total of 5 hours

\* He alludes to his first journey (1845), from the southern extremity of the Dead Sea to the Jebel Shammar.

† 'The Land of Midian (Revisited),' chap. xiii.

(=13½ miles), on a "Safh," the high bouldery bank of the Wady Surr, where it receives the Wady el-Kusayb; and we passed the greater part of the night battling with the warm, gusty and violent north-easter.

*March 15th.*—Sending the caravan up the Wady Surr, we set out at 6 A.M. up the Wady "Malayh" (Malih), the north-eastern branch falling into the *rond point* where we had nighted on February 19th. Passing a few Arab tents, we climbed across country to the Jebel Malih, of whose metallic wealth I had received notable reports; and from which accordingly I expected mighty little. We found literally nothing; but a few days afterwards, splendid specimens of cast copper were brought from it by a Bedawin. In the wady below is a large puddle of brackish water: hence probably the name—"salt" (Málih) not "pleasant" (Malih) valley. The element here is abundant, the thrust of a stick in the sands of the re-entering angles is followed by the reappearance of stored-up rain. It may also have been called after the Malih plant (*Lindenbergia Sinaica*).

Resuming our ride up the wady-bed, and crossing a divide to the Wady Daumah (of the "one Daum"), we dragged our mules down the precipitous left bank, a ladder of rock and boulder, and presently found ourselves in the upper Wady Surr. Broad and well-grown with vegetation, fan-palm and thorns, it defines, sharply as a knife-cut, the northernmost outlines of the mighty Shárr; whose apex, El-Kusayb, towered above our heads. Farther on we came upon what seemed to be a flowing stream: the guides, however, declared that it rolls nothing but rain, being bone-dry in summer. There the rocky bed made a sharp turn from east to south; and its "gate" opened upon another "broad," formed by the meeting of four wadys. After riding 3 hours (=7 miles) we dismounted to inspect the rude ruins of El-Zebbayyib which had been visited by Mr. Clarke.\*

This site is interesting, and yet, curious to say, it shows no signs of water nor of palm plantations. Here the Wady Surr, sweeping from the south and bending abruptly to the west or seaward, receives a northern affluent, the short watercourse draining the ruddy Abá 'l-bárid peak. The ruins stand *à cheval* upon another and eastern feeder, the Wady Zubayyib. Nearly opposite it, the Shárr block is broken by the Sha'b Makhúl, the eastern versant of the Nakb Abú Sha'r; but instead of the fairy wall of creamy and snowy quartz, there is a corresponding crest of gloomy black plutonic matter, ugly and repelling as gnome-land. The Bedawin distinguish between the eastern and

\* See, *ante*, p. 58, and 'The Land of Midian (Revisited),' chap. x.



western faces of the same block, and also between the wadys of the scarp and the counterscarp: for instance, the oriental front of the Ras el-Kusayb is called Abú Kurayg (كريم). This

is natural, as the formations, often of a totally different material, show contrasting features.

Still ascending the Wady Surr, we passed on the right bank the Wady el-Hámah (الحمامة), which receives the Wady Kh'shab-ríyyah before noticed. The latter, bifurcating in the upper bed, drains the Dibbagh and the Umm Jedayl blocks, and in the fork lie, we were told, the ruins of El-Fara', some 5 hours' march from this section of the Wady Surr. The word means "the upper part of a valley;" and hence possibly the mysterious "Fara' el-Samghí" which appears in my vol. i. p. 129. After marching 1 hour (= 3 miles) more, and a total of 4 hours 30 minutes (= 11½ miles), the guides made us camp at the foot of the ascent to be attacked next morning. They declared that the Sha'bs (Cols) generally cannot be climbed, even by the Arabs; I have reason to believe the reverse. Our ground

was called Safhat el-Wu'ayrah (وعيرة), "of the little Wa'r," from a slaty schistose-trap hill on the eastern bank of the Wady Surr: here also stood a "Mashghal" where copper was worked. Great excitement at night, when the Bedawin brought us in five specimens of that metal, incontinently declared to be gold!

*March 16th.*—At 6 A.M. we attacked the Shárr, in a general direction from north to south. On the left bank of the water-course rises a porphyritic block; an easy slope, dotted here and there with natural pilings of black rock, which look almost artificial. The summit is a horizontal crest, a broken wall, above which, on a more distant plane, rise the *Shenázir*, or "Pins," the two granite columns which are visible as far as the Shárr itself. This lower block is bounded, north and south, by gorges, fissures that date from the birth of the mountain. In the former direction yawns the Sha'b, technically called the *Rushúh* (رشوة) Abú Tinázib (طناضب), "Droppings of the Father of the Tanzub tree" (*Sodada decidua*). Southwards the Sha'b Umm Khárjah (خارجة) defines the outlier.

The ascent of this foot-hill occupied three very slow hours, and at 9 A.M. we stood 3200 feet above the sea-level (aner. 2679).

The only semblance of a climb was at the crest-wall of brown, burnished and quartzless traps. What most struck me was the increased importance of the vegetation, evidently the result of more rain, dew and cloud-shade. Here, besides *Rumex* and *Taraxacum*, appeared the strong-smelling *Ferula*, the *Sarh* (سرح),\* attaining the stature of a tree, and the homely hawthorn (عرعر *Crataegus*). The Arab word classically means

the cypress or the juniper-tree; in Jeremiah, where it occurs twice (xvii. 6 and xlviii. 6), the Eng. version renders it by "heath." It is now generally translated "savin" (*Juniperus Sabina*), a shrub whose purple berries have a strong turpentine flavour. The whole of the upper granite must have grown, in sheltered places, fine junipers, locally called *Habibah* (حبية); the few that now remain are as thick as a man's body. There are some signs of the ibis, hyæna and leopard; of the eagle and the splendid *caccabis* (El-Shinnár), of white and yellow butterflies, of ladybird-like *Ba'úzah*, of the wild bee and of the common housefly; the latter is very abundant in Midian, even when "organic matter" is apparently wanting.

The summit of the outlier is an inverted arch, with a hill, or rather a tall and knobby outcrop of rock, springing from either flank of the horizontal key. The inland (east) view was a panorama of the region over which we had travelled, a network of little chains, mostly running parallel with the Great Range; and separated from it by lateral, oblique, and perpendicular wadys. Some of these torrent-beds were yellow, others pink, and others faint, sickly green, with decomposed trap: all carried a fair growth of thorn-trees—acacias and mimosas. High over and beyond the Monarch of the Shafah Mountains, Jebel Sakhárah, whose blue poll shows far out at sea, ran the red levels of the Hismá, backed at a greater elevation by the straight lines of the black Harrah. The whole Tihámah range, now so familiar to us, assumed a novel expression. The staple material proved to be blocks and crests of granite protruding from the younger plutonics, which enfolded and enveloped their bases and backs. The solitary exception was the dwarf Umm Jedayl, a heap composed only of grey granite. The Jebel Kh'shabriyyah, in the Dibbagh Block, attracted every eye; the head was supported by a neck swathed as with an old-fashioned cravat.

Where the outlier-top is tolerably level, the shepherds had

\* The pure Arabic "*Sarh*" means tall, large trees, especially those free from thorns.

built small hollow piles of dry stone, in which the newly-yeaned are sheltered from the rude blasts. The view westwards, or towards the sea which is not seen, almost justifies by its peculiarity the wild tales of the Bedawin. Our platform is, as I suspected, cut off from the higher plane by a dividing-gorge some 300 feet deep, but it is bridged over by a ridge. Beyond it rises the great granite mask forming the apex. Down the northern sheet-rocks trickled a thin stream that caught the sun; and thus the ravine is well supplied with water in two places. South of it lies a tempting Col with a slope, apparently easy, which separates a dull mass of granite on the right from a peculiar formation to the left. The latter is a dome of grey granite, smooth, polished, and slippery, evidently unpleasant climbing; and from its landward slope rise abrupt, as if hand-built, two isolated gigantic "Pins," which can hardly measure less than 400 feet. They are the remains of a sharp granitic comb, whose apex was once the Parrot's Beak. The mass, formerly mammilated, has been broken to denticulations by the destruction of the softer strata: already the lower crest, bounding the Sha'b Umm Khárgah, shows perpendicular slicings, which will form a new range of pillars when these huge columns shall have been gnawed away by the tooth of time.

MM. Clarke, Lacaze, and Philipin, set out at 11 A.M., with a small party of quarrymen, to climb the Col, and lost no time in falling asunder. The latter made straight for "The Pins," and, reaching a clump of small junipers, was arrested by a *bergschrunde* which divides this second outlier from the apex of the Shárr—the Dome and the Parrot's Beak. Consequently he beat a retreat and returned to us after 3 hours 30 minutes of exceedingly thirsty work. The Egyptians, of course, shirked, enjoyed a sound sleep, and sauntered back, declaring that they had missed the "Éffendis." M. Philipin brought with him an ibex-horn still stained with blood, and a branch of juniper, straight enough to make an excellent walking-stick.

The other two struck across the valley, and at once breasted the couloir leading to the Col. They found more climbing than they expected, and reached the summit, visible from our halting-place, in 2 hours. Here they also were summarily stopped by a crevasse shedding seawards and landwards. Unfortunately they went without an aneroid. The time employed would give about 2000 feet; and thus their highest point could hardly be less than 5200 feet. Allowing another thousand for the apex, which they could not reach, the altitude of the Shárr would be between 6000 and 6500 feet. They came back at 4 P.M., triumphant with the spoils of travel—a venomous snake

found basking near a trickle of water; juniper-leaves and berries which serve to identify the species; a small helix picked up near the summit, and sundry Alpine plants. Before the glooms of night had set in we had descended, and were once more in the tents.

*March 17th.*—We left El-Wu'ayrah at 6.15 A.M., riding, still southwards, up the Wady Surr. The stony broken surface now showed that we were fast approaching its head. Beyond the Umm Khárgah gorge, in the western block, rises the tall Ras el-Rukabíyyah, and beyond it is a ravine in which palms and water are reported. The opposite (east) side is a monotonous trap-curtain, whose chief projections are the Jebels el-Wu'ayrah, el-Ma'in, and Sháhithah (شاحطة). A little beyond the latter debouches the Darb el-Kufl ("Road of Caravans"), alias El-Ashárif ("of the Sherifs"), a winding gap, the old line of the Egyptian Pilgrims, by which the Bedawin still wend their way to Suez. The broad mouth was dotted with old graves, with quartz-capped memorial cairns, and with blocks bearing tribal marks.

After 2 hours 30 minutes (= 7 miles), we sighted the head of the Wady Surr proper, a charming halting-place. Here the amount of green surface, the number of birds, and the open forest of thorn-trees, argue that water is not far off. Our Arabs determined to waste the rest of the day; but we pushed them on, and followed at 11 A.M.

The track led up a short, broad wady, separating the southernmost counterforts of the Shárr from the north end of the Jebel el-Ghúrab. This "Raven Mountain" is a line of similar but lower formation, which virtually prolongs the great "Landmark." Farther south lies, they say, a facile pass up the Wady Oujah (أوجه), an affluent of the Wady Zahakán, near Zibá. The Col el-Kuwayd (كويد), appeared one of the easiest we had yet

seen, and we reached the summit in 40 minutes. The seaward slope is a large outcrop of quartz *in situ*, a dull, dead, chalky-white variety, looking as if heat-altered and mixed with clay. The rock-ladder, leading to the lower Wady Kuwayd, which has an upper branch similarly named, offered no difficulty, and its height proved to be 470 feet (aner. 28.13–28.50). Having marched 1 hour 15 minutes (= 2 miles), or a total of 3 hours 45 minutes (= 9 miles), we found the caravan camped at the nearest pool, 19½ miles (dir. geog.) from our destination. An ugly Kham-sín, together with the heat of the enclosed valley, made sleeping well-nigh impossible. This Scirocco is locally called *El-Dufún*,

in full *Dufún el-Surayyá* (of the Pleiades) : in classical Arabic, as far as the dictionaries go, *Dufún* would derive from a root meaning simply "burying."

*March 18th.*—We began our only long ride at 4.20 A.M., and finished the monotonous Wady Kuwayd, which mouths upon the rolling ground falling coastwards. The track then struck to the north-west, across, and sometimes down, the network of watercourses that subtends the south-western Shárr; their uninteresting names have already been mentioned. After a total march of 7 hours (= 22 miles), we debouched upon our old Sharm, which showed, for the first time since its creation, two war-steamers with their "tender," the Sambuk. We were delighted to tread once more the quarter-deck of the corvette *Sinnár* (Capt. Hasan Bey), and all felt truly thankful to the Viceroy and the Prince who had so promptly and so considerably supplied my various requisitions.

This march round the Shárr had lasted six days (March 13–March 18). The distance covered from the ship and back was in round numbers 55 miles: Lieut. Amir's map prolonged the figure to 59½. The following is a list of stations and dates:—

1.	March 13.	Sharm Yáharr to the Kawáim	..	2 h. 45 m.	=	8 miles.
2.	"	14. To the Wady Surr .. ..	..	1 h. 30 m.	=	4½ "
3.	"	15. Safhat el-Wu'ayrah .. ..	..	4 h. 30 m.	=	11½ "
4.	"	17. To the Wady el-Kuwayd .. ..	..	3 h. 45 m.	=	9 "
5.	"	18. " Sharm Yáharr .. ..	..	7 h. 10 m.	=	22 "
Totals .. ..				19 h. 40 m.	=	55 "

The distances are probably too short, and Lieut. Amir's total, 59½, must be preferred, giving an average of a small fraction under 3 (stat.) miles per hour.

Our journey through Eastern or Central Midian thus lasted 18 days (Feb. 19–March 8), including the halts (March 1 and 6). It concluded with an excursion of a short week (March 13–18) to the apex of the country, the great Shárr. Despite forcibly slow marches at the beginning, we covered in round numbers, according to my route-book, 197½ miles: Lieut. Amir's map gives a linear length of 222 miles, not including the offsets. The second part represents 55 miles, besides the ascent of the mountain to a height of about 5000 feet. The mapper also increased this figure to 59½; and thus the route-line shows a grand total of 252½ to 281½ statute miles. The camels engaged from Shayhks 'Alayan and Hasan numbered 61, and the hire was 147*l.* 6*s.* 6*d.*, without including either 40*l.* of which we were plundered by the Beni Ma'ázah, or the cost of ascending the Shárr. The latter item (40*l.*) would raise the grand total to 187*l.* 6*s.* 6*d.*

PART III.—*Visit to South Midian*.

This southern journey proved by far the most interesting of the three. The region differs essentially from the northern, which had occupied two months, mostly wasted. Had we known what we do now, I should have begun with the end; and should have devoted to it the greater part of our time. The whole eastern counterslope of the outliers, projecting from the Ghát section known as the Jibál Tihámat Balawíyyah, is one vast outcrop of quartz. The parallelogram between N. lat.  $26^{\circ} 0'$ , including the mouth of the Wady Hamz (حمض), and N. lat.  $27^{\circ} 0'$ , which runs some miles north of the Badá plain, would form a Southern Grant sufficiently large to be divided and subdivided as soon as judged advisable.

The characteristics of North Midian (Madyan proper) are its argentiferous, and especially its cupriferous ores. South Midian worked chiefly gold and silver, both metals being mentioned by the mediæval Arab geographers. Spangles of gold were noticed by the Expedition in the rosy micaceous schists veining the quartz, and in the chalcedony-agate which parts the granite from the gneiss. The argentiferous *Negro-quartz* everywhere abounds, and Badá showed strewn spalled "Marú," each fragment containing its block of lead almost pure. Saltpetre is plentiful, and a third sulphur-hill rises from the maritime plain north of the Wady Hamz.

I. *Cruise to El-Wijh; March 21st*.—At Shárm Yáharr two days were employed in settling for past services, and in preparing for our march. The whole Expedition, except only the sick left at El-Muwaylah, was now bound southwards. The Sayyid and Shaykh Furayj accepted formal invitations to accompany us, and the Básh-Buzuks, Bukhayt and Husayn, were shipped as their henchmen; whilst a score of soldiers and quarrymen represented the escort and the working hands.

At 6.30 A.M. the *Sinnár*, dashing into the dark and slaty sea, tumbled by two days of equinoctial weather, stood to the south-east. The Shárr loomed large through the mist, and the air was so damp that our dry and wet bulbs showed a difference of only  $4^{\circ}$ – $5^{\circ}$ . We noted the Ras el-Mu'arrash (not *Maharash* as the Ad. Chart has it), and the Ras Abú Shárirah (not *Abu-sharirah*), mere sandy points with little projections of profile. After the gap of the Wady el-Ghál, we passed, at 10 A.M., Zibá with its dumpy tower. The high coralline bank, which forms the "Báb," runs some distance down shore, allowing passage to our ugly old friend, the Wady Salmá. Beyond that point the

Wadys Rank (رنق, "of turbid Water"), 'Amud (عمود, "of the Pillar"), and El-Baharah, none of them found on the chart, meander in usual Arabian fashion over all the land.

Off the northern Wady 'Amúd,\* the recipient of the Abú Marwah gorge,† and by far the most important of these features, lay two Sambuks at anchor, and a long line of vegetation decks the shore. I cannot help suspecting that it is the

Wady 'Aúnid (عونيد) of geographers, a name utterly unknown to the Arabs of these parts. El-Idrisí can hardly be mistaken when he says (iii. p. 5) "Then, after 'Akabat-Aylá, you come to El-'Aúnid, a haven with potable water; and *fronting it is the island El-Na'man* (read Nu'mán), 10 miles from the shore." El-Mukaddasi adds (i. p. 101), "El-'Aúnid lies on the coast of Korh (قورح),‡ near Hijr, a flourishing city, producing much

honey and possessing a fine port." Can Hijr here be Hajar, "the Village," the port of Strabo's Egra, the modern Wijh, and Korh the great Wady Kurr (قر) to the south of it?

Sprenger (Alt. Geog. p. 24), induced it seems by the similarity of sound, would derive the 'Ραννάθου κώμη (Rhaunathi vicus), which Ptolemy places in n. lat. 25° 40', from 'Aúnid, justly observing that the Arabs often interchange the 'Ayn and the Ghayn (Gháuníd = Rhaunathus), while the Latins convert the latter to "R," as "Razzia" for *Ghazweh*. Yet it is my belief that the true Wady 'Aúnid is the Wady 'Uwaynid, farther south.§

Below the Wady 'Aúnid, the Wady Dámah, halfway to the Wady Azlam, falls into the sea north of Abú Masárib (مسارب, "of Pastures"), which the Ad. Chart calls *Massahríb*, and Sprenger *Mazárib*. This long thin point, according to my friend, represents the Χερσόνησος Ἄκρα (*Chersónesi extrema*) which Ptolemy places upon the parallel of Rhaunathus. Here the coast-range, Jibál Tihámat Balawíyyah, now distinguished as the mountains of the lowlands of the Baliyy-land, begins to recede from the sea, and becomes mere hills and hillocks; yet

\* There is a southern Wady 'Amúd, distinguished as the 'Amúd Zafar (ضفر), whose blue hills we shall see from Sharm Dumayghah.

† See Part II. sect. iv.

‡ "Kurh" with the short vowel would mean water gushing from a well.

§ See Part II. sect. iii. The 'Ayn is the Heb. Oin, and the Ghayn is not found in that dialect; hence "Oreh" (a raven) becomes in Arabic "Ghuráb," and so forth.

the continuity of the 'chain is never completely broken. At noon we slipped into the channel, about  $1\frac{1}{2}$  (not 10 nor 60) mile broad, between the mainland and the islet known as the Jebel Nu'mán; similarly, Hassáni, island, is called Jebel, a hill, and never Jezírat, an island. This feature has a long lean tail, a sandy flat which projects far to the north-west several parallel lines of rainbow-green reef. It first appears as a narrow depressed quoin, 3 to 4 miles long by 1 broad; its Jebel is composed of two dwarf hillocks, one rounded, the other flattened. Both rise a little above the dorsum of desert-like material: yellow sandstones and corallines, whose dark-metalled surface is dotted with shrubs. We did not, however, find the Nu'mán plant (*Euphorbia retusa*), which is supposed to have given it a name. The rock gains height to the south-east, and forms four bluffs with horizontal and parallel stratification, much worked by wind and water. Two fine bays, facing the mainland, afford excellent anchorage. The northern showed a Sambuk hauled down for cleaning, a fishing-canoe lurking near the shore, and Arab tents on the plateau behind. The other, adjoining it to the south, is of larger size, not a little resembling Sináfir: at its bottom, behind the sands, rises a red *piton*, possibly the core of the islet, with a finial rock not unlike, from our range of view, a gigantic "Krupp."

During the return cruise we landed upon Nu'mán, and examined it carefully. Like the Dalmatian Archipelago, it was once mainland, probably separated by the process that raised the maritime range. The rolling sandy platform and the dwarf wadys are strewn with trap and quartz, which were never produced *in situ* on this bit of rock. During spring-tide the Huwaytát transport their flocks in the light craft called "Kati'rahs," and keep them while the pastures last. We made extensive inquiries, but we heard of no ruins; and yet Sprenger would here locate the *Τιμαγένης νῆσος* (*Timagenis insula*) of Ptolemy. If such be the case, either the Alexandrian or his manuscripts must greatly err. He places the bank in N. lat.  $25^{\circ} 45'$ , whereas its centre lies in N. lat.  $27^{\circ} 5'$ , a difference of  $1^{\circ} 25'$ . His 60 miles of distance from the coast, evidently the blunder of a copyist, must also be reduced to a maximum of three.

Passing the Wady Surayyá, and another old friend, the Aslah-Aznab, down whose head we had ridden to Shaghab, we crossed at 2 P.M. the mouth of the Wady Azlam ("of the Mountain Goat"), the "Ezlam" which Wellsted (ii. 183) unduly makes the southern frontier of the Huwaytát, and the northern limit of the Baliyy tribes. Here the Jibál el-Azlam trending from the north-east, abut upon, and run parallel with, the sea. Beyond



them lies the Sharm Jezai (جزاي, not Jizzeh nor Jezzay), a white gap in the line of dark-brown trap hills. Then comes the similar mouth of the once-populous Wady Dukhán (of "Smoke"), faced by a large splay of tree-grown sand; on the opposite African shore the name always denotes places where furnaces have been at work. Follow the coast-islands of Marsá Zubaydah (not *Zebaid*), connected by fords with the shore. Here the sea is bordered by the red-yellow coast range, whose fretted sky-line of peaks and cones, "horses" and "hogs'-backs," are cut by deep wadys, and drained by dark "gates." The background is a long regular curtain of black hills, whose white sheets and veins may be granites and quartz.

We then passed the little creek Minat el-Marrah, one of the many openings grown with vegetation; here the ruins El-Nabagah (نبقة, "of the Single Lote-tree"), are spoken of. At

4 P.M. we doubled the Ras Lebayyiz (لبيز, not *Lebayhad*),

a long flat tongue projecting well from the coast-range and defending its valley, which lies to the south. In the Far'at ("upper part"), some five hours' march from the mouth, lie important remains of the "Mutakaddimín," tall furnaces and scoræ; an "irregular" militant at El-Wijh confirmed this report. The Wady Lebayyiz nearly fronts the Nabakiyyah Island, a mere raised reef, with the sea breaking around it: here lay two fishing Kat'irahs, hunting mother-of-pearl. The Shakk el-'Abd ("Slave's Cleft") is another small Minat (refuge-harbour), a break in the shore between the Ras Lebayyiz and the Ras Salbah (ثلبه, not *Telbah*). And now the coast-range retreats far to the east, while its continuity is completely broken up into a multitude of dwarf cones.

The next important feature is the Wady Salbah, also lying south of its headland: we shall have much to say concerning its inland continuation, the Wady Nejd. On the dark hills of Salbah, the gloomy range ahead of us, appear the granite peaks and "pins" of Jebel Libn, gleaming white and pale in the livid half-light of a cloudy sunset. After 12 hours' steaming over 70-72 knots of reefy sea, we ran carefully into the Sharm Dumayghah, which my 'Pilgrimage' (I. xi.) called Damghah, one error amongst many rectified in my last volumes.\* This lake-like, land-locked cove is by far the best of the many good dock-harbours which break the Midian coast.

I resolved to pass a day in surveying the port; the Hydro-

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\* 'The Land of Midian (Revisited),' chap. xiv.

graphers give plans of Yáharr and Jibbah, ignoring one far more important. Distant only 30 miles of easy and safe coasting navigation, it is *the* harbour for the pilgrim-ships which El-Wijh endangers. The work of the Egyptian officers shows on the map an oval, about 1 knot in length, disposed north-west to south-east, with four bulges on the northern shore: the breadth may be 1200 yards. It appears to be the embouchure of the Wady Dumayghah, which falls into its head, and which, in the days of forests, must have rolled a large stream. The entrance is defended by a feature common on this coast, a natural breakwater, denoted by a dot upon the chart; it measures 340 yards by half that width, and it may be the remains of the coralline bed in which the torrent carved out the port. The northern inlet is a mere ford of green water; the southern, 25 fathoms deep, has 160 fathoms of clear way between the reef and shallows of either side. The bay shoals to the south-east, and the best anchorage for ships lies to the north-west, almost touching land: a reef or rock is reported to be in the middle ground, and native craft usually make fast to a lumpy natural mole of sandstone north of the entrance.

We landed to inspect the country, which belongs, not to the Juhaynah, but to the Baliyy, mixed with a few Kura'an-Huwaytát and Karaizah-Hutaym. Most of the shells were broken, not including, however, the oysters; and the usual eight-ribbed turtle appeared to be common. M. Lacaze picked up, on the northern sands, a large old bleached skull, which went into my collection. We failed to find any neighbouring burial-place: striking, however, inland, towards the "Fort (Ruin)" of the Chart, we came upon an old cemetery to the north of the bay, and concluded that the graves had originated the mistake.

The Jibál el-Salbah, and its wadys to the east, showed the familiar low-level conglomerates, and quartz-seamed high ranges of dark traps. The mouth of the northern gorge is blocked by a vein of finely-crystallised carbonate of lime, with an astringent taste, possibly resulting from the presence of alumina. Signs of Arabs appeared everywhere, but we were unable to ascertain the extent or even the existence of water, an important consideration if this is to become the port of El-Wijh. The Hajj-road, running some miles inland, is doubtless supplied with the necessary, and these Bedawin could hardly live without it. Shaykh Furayj pointed out to us, far in the north, the blue peaks of the 'Amúd Zafar, in whose branch-wady stand the ruins of M'jirmah. The day ended with a sudden trembling of the ship, as if straining at anchor; the apparent direction of this earthquake, or rather waterquake, was from north to south, time 9.10 P.M., and duration 20". According to the Arabs, the

motion is not uncommon in Midian, especially about the vernal equinox: on the present occasion it ended the spell of damp and sultry weather, which began on March 16, and which may have been connected with it.

*March 23rd.*—The soundings were not finished before 7.40 A.M., when the old corvette resumed her rolling, rollicking way southward; as usual, she was without ballast. After steaming 1 hour (= 7 miles) we sighted the green mouth of the Wady 'Antar, in whose Istabl, or upper valley-course, the pilgrims camp. It drains a small inland range to the north-east; this feature bore  $80^{\circ}$  (mag.) when we were 2 miles south of Dumayghah, and it was then hidden by the taller block to seaward. The Ad. Chart, besides confounding the two, has applied "Istabl" to the height instead of the hollow. Jebel Libn, vulgò "Libin," suggests grey granite and white quartz; hence, probably, the name, identical with Lebanon and Libanus, the "Milk-mountain." The Bedawin have, doubtless, their own terms for every feature: the citizens divide it into two, El-Áli (the "upper") being its southern, and El-Asfal (the "lower") its northern section. It is a little brother of the Shárr, measuring 3733 instead of 6000–6500 feet. We first see from the north a solid block, capped with a mural crown of three peaks. When abreast of us, the range becomes a tall and fissured wall, perpendicular to the west: it reposes upon a base which slopes at the angle of rest; and it falls into the sandy enviroining wady. To complete the resemblance, even the queer "pins" are not wanting. It is said to abound in water; and a Nakhil ("date-grove") is described as growing near the summit. The tribe which owns the most of it, the despised Hutaym, claims the negro hero, poet and lover, 'Antar, as one of their ancestors—hence, probably, his connection with the adjoining mountain and "the Stable."

I will here briefly consider the status and the relations which this block bears to the western Gháts of Northern Arabia. The "Jebel Libn" is the great feature of the Tihámat Baláwiyyah; for many days it will appear to follow us, and this is the proper place for assigning its site and status to it. We have prospected about El-'Akabah, the northern head of the Gháts or coast-ranges, the single chain of Jebel Shará, the "Sa'ar of the tribes of the Shasu" (Bedawi)\* in the papyri; and the Hebrew Mount Séir, the "rough" or "rugged." Farther south we have noted how this tall eastern bulwark of the great Wady el-'Arabah, bifurcates, forming the Shafah chain to the east; and westward of it, in Madyan Proper, the Jibál el-Tihámah, of which the

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\* See my vol. i. chap. vii.

Shárr is perhaps the culmination. We have noted the accidents of the latter as far as Dumayghah Cove; and now we descry in the offing the misty and distance-dwarfed forms of the Jebel el-Ward, the Jibál el-Safháh (صفحة), the two blocks south of the Wady Hamz, known as the Jibilayn el-Rál, and their neighbours, still in the Tihámat Baláwiyyah. Lastly we shall sight behind El-Haurá the Abú Ghurayr,\* and a number of detached blocks which, like the former, are laid down, but not named, in the Admiralty Charts.

Beyond El-Haurá the chain still stretches southwards its mighty links with smaller connections. The first is the bold range Jebel Radwah, the "Yambo Hills" of the British sailor, rising some 6000 feet high, and lying 35 miles behind the new port.† Passing it to left on the El-Medinah route, I heard the fables which imposed upon Abyssinian Bruce; "all sorts of Arabian fruits grow in perfection on the summits of these hills; it is the paradise of the people of Yenbo, those of any substance having country houses there;" and so forth. This was hardly probable in Bruce's day, and is now impossible: the mountain is held by the Beni Harb, a most turbulent tribe, for which see my 'Pilgrimage,' vol. i. pp. 364-5. Their head-shaykh Sa'd the Robber, who still flourished in 1853, is dead, and has been succeeded by one of his sons, Shaykh Hudayfah, who is even worse than the sire. Between these ill-famed haunts of the Beni Harb and Jiddah rises the Jebel Subh, which Raper (p. 527) calls Jebel Soubah. It is "a mountain remarkable for its magnitude and elevation" (4500 feet), inhabited by the Beni Subh, a fighting clan of the "Sons of Battle."

The largest links of these west Arabian Gháts are composed of white-grey granite, veined and striped with quartz; and they are subtended inland by the porphyritic traps of the Jibál el-Shafah, which we shall now trace in the parallel of El-Hamz, the end of Egypt. I cannot, however, agree with Wellsted (ii. 242, 3) that the ridges increase in height, as they recede from the sea; or that the veins of quartz run horizontally through the "dark granite." The greater altitudes (3000-6000 feet), visible from an offing at 40-70 miles, are connected by minor heights: some of them, however, are considerable, and here and there they break into detached pyramids. All are maritime, now walling the shores, like the Tayyib Ism and

\* Perhaps from Ghurayrá, the name of an aromatic plant.

† The old being the classical 'Ἰαμβία κώνη (*Iambia vicus*), now Yambu' el-Nakhil ("Spring of the Palm-tree"), in Ptolemy's time a sea-port, at present 15 miles to the north-east (N. lat. 24° 12' 3" ?) of the modern town in N. lat. 24° 5' 30" (Wellsted, ii. 220). According to the Arabs it lies 6 hours' march from the sea.

Mazhafah, then shearing away from it, as about the Rál, where a broad "false coast" has been built by Time.

These western Gháts, then, run down either in single or in double lines the whole length of occidental Arabia, and meeting a similar and equally important eastern line they form a mighty nucleus, the mountains of El-Yemen. After carefully inspecting, and making close inquiries concerning, a section of some 500 miles, I cannot but think that the mines of precious ore, mentioned by the mediæval Arabian geographers,\* lay in offsets from the flanks either of the mountains or the inland chain; that is, they are either on the Tihámah, the coast lowlands, or in El-Nejd, the highland plateau of the interior.

What complicates the ground is the long line of volcanic action which, forming the eastern frontier of the plutonic granites and of the modern grits, may put forth veins extending even to the shores of the Gulf of 'Akabah and the Red Sea.† The length, known to me by inquiry, would be about three degrees between N. lat. 28° and 25°, the latter being the parallel of El-Medínah: others make them extend to near Yambú' in N. lat. 24° 5'. They may stretch far to the north, and connect, as has been suggested, with the Syrian centres of eruption, discovered by the Palestine Exploration. I have already explained ‡ how and why we were unable to visit the "Harrah," lying east of the Hismá; but we repeatedly sighted its outlines and I determined that its lay is from north-west to south-east. Farther south, as will be seen at El-Haurá, the vertebræ curve seawards or to the south-west, and seem to mingle with the main range, the mountains of the Tihámat-Jahaniyyah, of the Juhayni. Thus the formation assumes an importance which has never yet been attributed to it, and the five several "Harrahs," reported to me by the Bedawin, must be studied in connection with the mineralogical deposits of the chains adjoining them. It must not be forgotten that a fragment of porous basalt picked up by the first Expedition near Makná yielded a small button of gold.§

Dreadfully rolled the *Sinnár* before the long heavy swell from the north-west. It was a bad time off the Dabbat ("high land") || el-Marga'h ("of Refuge," not *Ras Margah*); a little relief, however, was felt when running down the channel between the mainland and the reef Kata' el-Ras (قطع الراس):

\* See my vol. i. chap. ix.

† 'The Land of Midian (Revisited),' chap. vi., describes one of these sporadic (?) outcrops near Tayyib Ism; and chap. ix. notices the apparently volcanic sulphur-mount near El-Muwaylah.

‡ Vol. ii. chap. x.

§ See my vol. i. chap. xii.

|| Dabbat properly means a sand-hill or heap.

the chart does not name it, but notes "good anchorage on the east side of these shoals." The long, low island of Raykhah (ريخه, "the loose or straddling"), to the w.s.w. of El-Wijh, may protect the port in that direction, and form, as Wellsted says (ii. 185), an "excellent mark for entering," but it did us no good. The nuisance returned in force as, doubling the Ras Muraybit (مریبط, not *Marabut*), we sighted El-Wijh. The

gape of its wady is backed by the Hamírat, or "Red Range," and fronted by its two towers, the round Burj and the cubical lighthouse. And we were quiet once more when the *Sinnár*, at 12.15 P.M., having covered her 30 miles in 4 hours 30 minutes, cast anchor in the usual place, south-east of the northern jaw. The log showed a total of 102 miles between the Sharms Yáhárr and El-Wijh, or 107 from the latter to El-Muwaylah.

El-Wijh,\* meaning the "Face," an abbreviative form of El-Wijh el-Bahr (the "Face of the Sea"), lies in N. lat. 26° 14'. It is evidently an old site, although the ruins have been buried under generations of modern buildings; Sprenger (p. 21) holds it to be the seaport of "Egra, a village in the territory of Obodas," a corruption of the Arabic El-Hajar, the town or townlet. Hence, according to Strabo (xvi. cap. iv. § 24) Ælius Gallus embarked his baffled troops for Myus Hormus.† Pliny (vi. 32) also mentions the "Tamudæi, with their towns of Domata and Hegra, and the town of Badanatha." It is generally remarked that "Egra" does not appear in Ptolemy's lists, yet one of the best texts (Carolus F. A. Nobbe, Lipsiæ, 1843) reads *Erga*, instead of the Negran (Nejrán), which Bilibaldus Pirckheymerus (Lugduni, MDXXXV) and others placed in N. lat. 26° 0'. Sprenger formerly believed El-'Amúd to be Strabo's "Egra," the haven for the northern; as El-Haurá was for the southern, and El-Wijh for the central regions.

I have no intention again to describe El-Wijh,‡ except as a quarantine station connected with the Pilgrimage-Caravan. It has been admirably adapted to such purposes, after laying out much money in a lighthouse, a masonry landing-pier, doctors' quarters, guard-houses, bake-houses, and an establishment for condensing water. It has been abolished, very unwisely, methinks, in favour of "Tor Harbour." The latter, inhabited by a ring of thievish Syro-Greek traders, backed by

\* In classical Arabic Wajh is a face, and Wijh a side.

† See my vol. i. chap. viii.

‡ See 'The Land of Midian (Revisited),' chap. xiv.

a wretched sandy wild, comfortless enough to make the healthiest lose health, is—worst of all—so near Suez that infection can travel easily. A wealthy pilgrim has only to pay a few gold pieces; his escape to the mountains is winked at, and thence he travels or voyages comfortably to Suez and Cairo. Even without such irregularities, the transmission of contaminated clothing or other articles would suffice to spread cholera, typhus and small-pox. Tor is, in fact, an excellent medium for focussing, and for propagating contagious disease; and its vicinity to Egypt, and consequently to Europe, demands that it should at once be abolished.

The objections to El-Wijh are two, both equally invalid. The port is dangerous during westerly winds; and pilgrim-ships bank their fires ever ready to put to sea. True; but, as has been shown, Sharm Dumayghah, the best of its kind, lies only 30 knots to the north. The second, the want of water, or of good water, is even less cogent. The seaboard wells supply the poorer classes and animals; and we shall presently see the Fort wells, which in their day have watered from 20,000 to 30,000 thirsty men and beasts. So far from the condensers being a failure, the tank still holds 20 tons of distilled water, although it gives drink to some thirty mouths composing the establishment. Finally the tanks of the old paddle-wheel steamer, moored off the town, have done good work, and are ready to do it again.

Thus the expense of laying out the quarantine ground at El-Wijh has been pitifully wasted. That, however, is a very small matter; the neglect of choosing a proper position is serious, even dangerous. Unlike Tor, nothing can be healthier or freer from fever than the Pilgrims' Plateau. From El-Wijh, too, escape is hopeless; if a pilgrim left the caravan a Bedawi bullet would soon persuade him to stop. Here, then, should be the first long halt for the "compromised" travelling northwards. When contagious disease has completely disappeared, the second precautionary stoppage might be either at Tor or, better still, at the 'Uyún Músá (Moses' Wells) near Suez; where sanitary conditions are far more favourable, and where supplies, including medical comforts, would be cheaper as well as more abundant. Briefly, it is my conviction that, under present circumstances, "Tor" is a standing danger, not only to Egypt, but to universal Europe, and that its only remedy would be El-Wijh.

II. *To the Southern Sulphur Hill and Cruise to El-Haurá.*—At El-Wijh I again divided the party. MM. Marie and Philipin, with Lieut. Yusuf as surveyor, were directed to march southwards to inspect a sulphur-hill, and to report upon the Wady

Hamz and a ruin near its banks. Meanwhile the rest of us would proceed in the *Sinnár* to El-Haurá, a roundabout cruise of 100 miles or so southwards.

There is no need to describe M. Marie's march, which covered ground afterwards travelled over by the united Expedition. He was successful in discovering the sulphur-hill, the third now known upon the Midian coast. After riding 5 hours 40 minutes (= 17 miles), the party reached the base of the Tuwayyil el-Kibrít, the "Little long (Ridge) of Brimstone." It appears from afar a reddish pyramid, rising about 2 miles inland of a fine inlet, which is said to be safe navigation. Thus far it resembles the Jibbah find; on the other hand, it is not plutonic but chalky, like those of Makná and "Sinai," the crystals being similarly diffused throughout the matrix.

The travellers slept at the base of the "Tuwayyil." Next morning M. Philipin proceeded to collect specimens of the sulphur and chalcedony-agate strewn over the plain. M. Marie and Lieut. Yusuf rode on to the banks of the Wady Hamz, and in 3 hours (= 9 miles) they came upon the ruins of a Gasr ("castle") that unexpectedly turned up trumps. I had carelessly written for them the name of a ruin which all believed would prove to be one of the normal barbarous, "Hawáwít." They brought back specimens of civilised architecture; and these at once determined one of the objectives of our next journey. On March 28th the party returned to El-Wijh in the highest of spirits, after a successful trip of more than 50 miles.

Meanwhile I steamed southwards, accompanied by the rest of the party, including the Sayyid, Furayj and Mohammed Shahádah, ex-wakil ("agent") of the Fort el-Wijh, a prosperous merchant much trusted by the Bedawin. He brought with him, by way of Ghafir, or "guide," one Rájih ibn 'Ayid of the Fawá'idah-Juhaynah; and the fellow was not a good specimen of his ill-favoured and ill-famed tribe.

*March 24th.*—We set out at 4.30 P.M.; and steamed due west till we had rounded the northern end of Raykhah Island. We then went to the south-west and passed to port the white rocks of Mardúnah Island,\* capping the ugly reefs and shoals that forbid ships to hug this section of the shore. The patch fronts the headland Ras el-Ma'allah, where, as at El-'Akabah and Makná, sweet water springs from the salt sea-sands—a freak of drainage so common on the dismal Somali coast. We then ran along the Sharm *Habbán* (not "Abbán"), and the Ras Munaybarah (منبره); and before nightfall we had sighted

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\* Mardún in the dictionaries is a kind of wasp.



Ras Kurkumah (كرمة), which Keith Johnston writes "Ras Ghurkuma." This yellow point, so called from its "curcuma" (turmeric, saffron, dioscorides), here faces the islet-tomb of Shaykh Marbat (مرابط), not "Shaykh Hasan el-Marábit" ('Pilgrimage,' I. xi.), nor *Morábit* (Wellsted, ii. 183). Upon this part of the shore, I was afterwards told, are extensive ruins, not visited by Europeans on account of the dangerous Juhaynah. The south-eastern background is formed by tall and misty highland blocks, the Gháts of the Tihámat-Jahaní-yah. Northernmost, and prolonging the Libn, runs the regular wall of the Jebel el-Ward; then rise the peaks and pinnacles of the Jibál el-Safhah; and, lastly, the twin massifs, El-Rál. Faint resemblances of these features sprawl, like huge caterpillars, over the Admiralty Chart, but all sprawl unnamed.

*March 25th.*—The consequence of yawing and of running half-speed by night was that we reached Jebel Hassáni just before noon, instead of at 8 A.M. The island is a long yellow-white ridge, a lump of coralline 400 feet high, bare and waterless; yet at certain seasons it feeds the Bedawi flocks. Buttressed and bluff to the south-west, whence the strongest winds blow, it is prolonged by a flat spit to the south-east, and by a long tail of two vertebræ trending north-west. Thus it gives safe shelter to Arab barques, as noticed in my 'Pilgrimage' (I. xi.), where, however, it is erroneously called "Jebel Hasan." Its parallel is a few miles north of the "Dædalus Light" (N. lat.  $24^{\circ} 55' 30''$ ) to the west; and it lies a little south of El-Haurá on the coast (N. lat.  $25^{\circ} 6'$ ), and of El-Medinah, distant about 130 direct miles in the interior. If Ptolemy's latitudes are to be consulted, J. Hassáni will be the "Island of Timagines" in N. lat.  $25^{\circ} 40'$ ; while the Chersonesus Point (also in N. lat.  $25^{\circ} 40'$ ), "Jambia," being in N. lat.  $24^{\circ} 12'$ , would be represented by the important and well-marked projection of "Abú Madd" ("Father of the Flux" or high tide), which intercepts the view to the south.

Rounding the southern spit we turned to north-east and by east, and passed, with a minimum of 7 fathoms under keel, between J. Hassáni and the flat Umm Sahr (سحر); this "Libnah" of Wellsted (ii. 195) is a sandbank hardly visible from the shore, and deserves its name, "Mother of Deception." Here lies the only good approach to the saline and spacious bay, on which was built the southernmost Nabathæan port-town; all the others either require skilful pilots, or they are sealed by reefs and shoals. With the blue and regular-lined

curtain, Abú 'l-Ghurayr (غدير), in front, stretching down coast to Ras Abú Madd, we bent gradually round to the north-east and east. We then left to starboard the settlement El-Amlaj (املج),\* a scatter of the usual dull, dark-brown huts. We ran for safety  $1\frac{3}{4}$  mile north of the exposed Ras el-Haurá; and at 1.30 P.M. (=21 hours) the *Sinnár* anchored, in 9 fathoms, under the protecting shallows Katá 'at El-Wazamah (وضمة).

El-Haurá is not found either in the charts or in Ptolemy's and Sprenger's maps. It lies in N. lat.  $25^{\circ} 6'$ , about the same parallel as El-Medinah; and in E. long. (Gr.)  $37^{\circ} 13' 30''$ . For these observations, which were taken by Násir Effendi Ahmed, First Lieutenant of the *Sinnár*, I am not answerable, although the latitude cannot be far out. Thus the latitudinal distance between El-Haurá and El-Wijh (N. lat.  $26^{\circ} 14'$ ) would be 68 geographical miles. Wellsted (ii. 195) heard of, but never saw its ruins. He greatly errs when he makes this station, or its neighbourhood, the frontier of the "Bilí" and the "Joheínah": this line, as has been seen, lies nearly 50 geographical miles farther north. He also translates the word (ii. 461) "the bright-eyed girl," instead of the White (Village), *Albus Vicus*. He ignores, again, its other name Dár el-ishrin ("No. XX. Station"), so called because the Cairo caravan formerly reached it in a score of days, now reduced to nineteen.

According to Sprenger, the White Village, or Castle, was a Nabathæan, not a Thamudite port. Here Ælius Gallus disembarked his troops from Egypt. Strabo (xvi. cap. 4, § 24) shows that Λευκή κόμη was the starting-place of the caravans which, before the Nile-route to Alexandria was opened, carried the merchandise of India and of south Arabia to Petra. Thence the imports were passed on to Phœnicia and Egypt, and these pages have shown why the journey would be preferred to the voyage northwards. He is confirmed by the *Periplus* (cap. xix.), "from the Port and the Castellum of Leukè Kóme, a road leads to Petra, the capital of the Malicha (El-Malik), King of the Nabathæans; it also serves as an emporium to those who bring wares in smaller ships from Arabia. For the latter reason, a Perceptor, or Toll-taker, who levies 25 per 100 *ad valorem*, and a Hekatontarchus (centurion) are there stationed." As the Nabatæ were vassals of Rome, and the whole region had been ceded to the Romans (Byzantines) by a chief of the

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\* Amlaj is either a brown and barren waste or a myrobalan-tree.

Beni Kudá' tribe, this Yuzbashi, or military commandant, was probably a Roman.

El-Haurá, like most of the old coast-settlements, shows two "quarters," a harbour-town, and what may be called a country town. The latter is built upon a long tongue of land backing the slope of the sea-cliff, and attached to the low whitish hillocks rising down south; it is now a luxuriant orchard of emerald palms forming three large patches. Behind it swells a dorsum of golden-yellow sand, and the horizon is closed by ranges of hills and highlands, red and white, blue and black. The region is far more riant and amene than that higher up coast; and the whole shore-line seems to be broken with verdant valleys. The Wady el-'Ayn with its many branches beautifies the north; and, in the southern part, the Wady el-Daghaybij (دغيبج)\* supplies water between its two paps.

Before the evening we landed at a shallow bay bearing 30° (mag.) from the corvette's anchorage. A few yards walk inland led to the unimportant Wady el-Samnah (سمنه),† draining low hills of the same name. The loose sand is everywhere strewed with bits of light porous basalt, which comes from the Harrat el-Buhayr (بحير), a bluff quoin to the north-west.

About El-Haurá, I have said, the volcanic formations, some 60 miles inland on the parallel of El-Muwaylah, approach the coast.

We were guided to the ruins by the shouts of sundry Arabs defending their harvest against a dangerous enemy, the birds:—rattles and scarecrows were anything but scarce. Apparently the sand contains some fertilising matter. A field of dry and stunted Dukhn (*Holeus Dochna*), or small millet, nearly covers the site of the old *Castellum*, whose outline, nearly buried under the drift of ages, we could still trace. There are two elevations, eastern and western; and a third lies to the north, on the right side of the Wady Samnah. Scatters of the usual fragments lay around, and the rocks of white coralline explained the old name—"Whitby." The Bedawin preserve the tradition that this was the most important part of the settlement, which extended nearly 4 miles southwards. The dwarf valley-mouth is still a roadstead, where two small craft were anchored; and here, doubtless, was the hive-corner allotted to the community's working-bees.

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\* Daghbjat means driving to water every day.

† Samnah, the grains of a shrub like pepper, made into a fattening medicine for women.

*March 26th.*—We set out shortly after dawn, with a strong party of marines, to visit the south end of Leukè Kóme. A mile's row to 127° (mag.) landed us at a modern ruin, the work of a Yambú merchant who had here failed to establish a store. Thence a few minutes' walking over loose sand led to the Hajj-road; it is paved, like the shore, with natural slabs and ledges of soft modern sandstone, which, being foot-worn, makes good "metal." The broad highway, scattered with quartz and basalt, greenstone and serpentine, crossed a branch of the Wady el-'Ayn, whose rich and saltish sand grew "Dukhn" and the Nilotic Halfá-grass (*Cynosurus durus*), tamarisk-thicket and tufts of fan-palm. On its left bank a lamp-black vein of naked basalt, capped by jagged blocks, ran down to the sea and formed a conspicuous buttress. The guides spoke of a similar volcanic outcrop above Point Abú Madd, and of a third close to Yambú harbour.

A slow hour showed us the first ruins; wall-bases built with fine cement crowning the summit of a dwarf mound to the left of the road. We then entered the palm-orchards fenced with thorn, tamped earth and dry stone: young trees had been planted; and Dukhn-fields gave an agricultural touch to the scene. The high-road path to the Wady Haurá (حوراء), where

the caravan camps; it still shows all the requisites of an "eligible position," a quarter inhabited by rich citizens.

At the third or southern palm-patch we found remnants of the only public works still visible. This Káriz, or underground aqueduct, conducted towards the sea the drainage of the Jebel Turham (ترهم), a round knob shown on the Ad. Chart;

which bears 121° (mag.) from the conduit-head. The line has long ago been broken down by the Arabs; the 'Ayn ("fountain") may be seen issuing from a dark cavern of white coralline; it then hides itself beneath several pittings that represent the old Najwah (air-holes); and, after flowing under sundry natural arches, the remains of the conduit-ceiling, it emerges in a deep fissure of saline stone. From this part of its banks we picked up fair specimens of saltpetre. The lower course, abounding in water-beetles and choked with weeds, ends in a shallow pool grateful to birds.

The turbulent Juhaynah were mostly in the upper country; a few wretched fellows, however, assembled and began to squabble about the right of leading strangers into our country (*bilád-ná*). They and the guides gave us discouraging details concerning a ruin represented to lie some hours off, in the

nearest of the southern Harrahs. According to them the Kasr el-Bint ("Maiden's Palace") was in the same condition as El-Haurá; showing only a single pillar, perhaps the "Columns" to which Wellsted alludes. The young person whose vague name it bears was a sister of the well-known Warakat ibn Naufal (ورقة ابن نوفل); the former settled upon the

mainland, while the brother built a corresponding castle upon Jebel Hassáni. Neither here nor elsewhere could I learn anything concerning the human skeleton which Ibn Mujáwar, some 600 years ago, found imbedded in a rock near the sea-shore.

A few words concerning the "Harrahs" of this part of Arabia. The author of the *Kitab Futúh el-Buldán* ('The Conquests of El-Islam') states that the lands known to Arabia as *El-Harrah* are eight; of these he and Ibn Khaldún (El-'Ibar) mention two—1. Harrat Beni Sulaym, from a tribe now vanished; and, 2, the Harrat el-Nár, lying between Taymá and the Wady el-Kurá (the Wady Hamz?). The learned Dr. Wetzstein, in the Appendix to his 'Reisebericht,' &c.,\* records a conversation with A. von Humboldt and Carl Ritter (April 1859), respecting the specimens which he had brought from the classical Trachonitis. Their fresh texture and appearance led the latter to question whether the latest eruptions of the Harrat Rájil, as it is called from a neighbouring wady, may not have taken place during the historic period, and he referred to Psalm xviii. as seeming to note the occurrence, during David's reign, of such a phenomenon in or near Palestine. Humboldt deemed it probable that the Koranic legend (cap. cv.) of the Abyssinians under Abraham being destroyed by a shower of stones baked in hell-fire, referred, not to small-pox,† as is generally supposed, but to an actual volcanic eruption in Arabia.

"With what interest would that great man have learned," writes Wetzstein, "that as I was turning over the leaves of Yákút's 'Geographical Lexicon,' I found no less than 28 different volcanic regions between Haurán and Báḅ el-Mandeb known to the Arabians!" Later still Dr. Otto Loth published an elaborate paper "On the Volcanic Regions (Harras) of Arabia, according to Yakut," in which these eruptions are nearly all identified and described.

\* This is the volume which I have translated. See also Dr. Beke's papers in the 'Athenæum' (Feb. 8th and 15th, 1873), his 'Mount Sinai a Volcano,' (*passim*); and his 'Sinai in Arabia,' p. 535.

† There are, as far as we know, two great centres whence this foul disease spread. The eastern is Mongolian-China, which retains traditions of it in a.c. 1122; the western, intertropical Africa: from the latter it is supposed to have invaded Europe in the sixth century.

"Among the numerous volcanoes thus found to exist within the Arabian Peninsula," remarks Dr. Beke, "the only one recorded as having been in activity within the historic period is the Harrat el-Nar\* (Fire Harrah), situate to the north-east of Medina, in the neighbourhood of Khaibur (Khaybar), in about 26° 30' N. lat. and 40° E. long.; which, being traditionally said to have been in an active state six centuries before Mohammed, had actually an eruption in the time of the Prophet's successor, Omar. To the north-west of this 'Fire-Harra' lies that known as the 'Harra of (the tribe of) Udhra' (El-Azrá); again to the north of this is 'Harra of Tabúk,' so called from the station of that name on the Hadj road from Damascus to Mekka, the position of which is in about 28° 15' N. lat. and 37° E. long., and beyond this last, farther to the north, and consequently between it and the northernmost Harra of the Râdjil, or Trachonitis, is the Harra Radjlâ.† . . . Its designation, which means 'rough,' 'pathless,' seems to indicate its peculiarly rugged surface, and to lead to the inference that it is an immense field of lava."

Hence my late friend concluded that his "true Mount Sinai" was the focus and origin of this volcanic region; and that the latter was the "great and terrible wilderness" (Deut. i. 19) through which the children of Israel were led on their way to mysterious "Kadesh-barnea." Thus, too, he explained the "pillar of cloud by day" and the "pillar of fire by night" (Exod. xiii. 20).

Returning along the shore, we embarked and bade adieu to Leukè Kóme. The old corvette made the usual semicircle, but the sea had subsided to a dead calm, and we reached El-Wijh in 18 hours 15 minutes.

III. *The March to the Gold Mines.*—The preliminaries of our journey were soon settled at El-Wijh; and the Baliyy tribe made no difficulties. We were to be escorted by old Shaykh Mohammed 'Afnán, his son Sulaymán, his two nephews, Hammád and Náji, his factotum, the mulatto Abdullah, and his wákil ("agent") the big black slave, Abdullah Mohammed. The immediate objective of this, our last march, was the Badá plain and the Mochoura of the ancients, the mediæval Marwah or Zú Marwah. I also determined to visit a traditional coal-mine; and, finally, to return to El-Wijh *viâ* the Wady Hamz, inspecting both it and the ruins first sighted by MM. Marie and Philipin.

*March 29.*—At 1.45 P.M. we left El-Wijh, with 58 camels, of which 7 were intended to carry water—as will be seen, they

\* See Wallin, p. 327.

† Rajlá in Arabic means rough and stony ground = Trachonitis. Râjlil is a well-girt walker.

were necessary. The afternoon was hot and unpleasant; in later March the Harwá el-'Uwwah,\* a violent sand-raising norther, sets in and lasts a fortnight. It is succeeded (early April) by the calms El-Ni'am ("the Blessings"), which, divided into the Greater and the Less, last 40 days. Then the summer.

From the raised and metalled bank where the Burjstands, we rode down to the broad mouth of the Wady el-Wijh, draining the low, blue-brown hills that form the eastern horizon. On our left opened the dull embouchure of Wady Mansá (منصا); and to the right lay el-Melláhah, the Salina, distant about a mile from the town. It is an oval of some 1800 yards from north to south; and the banks are padded with brown slush frosted white, which in some places "bogs" men and asses. Beyond it are sparkling, glittering, dazzling blocks of pure crystallised salt, and the open water in the middle is tenanted by wild-fowl. At the lower or northern end, a short divide separates it from the sea, which during westerly gales runs far inland: it would be easy to open a regular channel between the harbour and its saltern. The head is formed by the large Wady Surrah, whose many feeders at times discharge heavy torrents. The walls of the valley-mouth are marked, somewhat like the Wady Hárr, with caverned and corniced cliffs of snow-white, canary-yellow, and rose-pink corallines.

Ascending the Wady el-Wijh, we left to the right the two brackish pits or wells, Bir el-Isma'il and El-Sannúsi (سنوس),

which supply the poor of the port. After 1 hour 15 minutes, we passed through a "gate" formed by the "Hamírat-Wijh," the Red Hill, noticed when we approached the town. Here the gypsum, white and black, ruddy and mauve, overlies rounded masses of granite; and the Secondary formation is succeeded by the usual red felsites and green traps—a copy of the Wady Sadr in the northern Shafah range. A fine vein of sugary quartz also trended north-south. After 1 hour 45 minutes (= 6 miles), we suddenly sighted the inland fort, whose littered environs show the camping-ground of the Pilgrim-Caravan. Here we were welcomed by its commander, Lieut. Nassár Ahmed, whose garrison, 13 regulars, looks clean and healthy, and who keeps his castle in excellent order. It is the usual square, straight-curtained work of solid masonry with a circular bastion at each angle. The northern face is subtended by 3 large cisterns, all strengthened at the inner angles by the stepped buttresses,

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\* 'Awwá in Arabic is the name of the thirteenth mansion of the moon, or four or five stars in Virgo.

first noticed among the ruins of Magháir Shu'ayb. The only object of interest in the fort is the inscription with an illegible date, bearing the name of Ahmed ibn Taylún, who founded his dynasty in A.D. 868. This is another proof that the Mamlúk Soldans were lords of the soil, and that South Midian was, even in the ninth century, a dependency of Egypt.

Up the valley, and north-east of the Fort, lie the palm-plantations, the kitchen-gardens, and the far-famed wells of El-Wijh. The sandy bed, disposed east-west, is streaked, dotted, and barred with outcrops and walls of the hardest green stone; and those disposed north-south must arrest, like dykes, the subterranean flow. Of the six masonry-revetted pits four, including El-Tawilah, the deepest, supply brackish water, and the same is the case with a fifth inside the Fort. The sweet wells are the Bir el-Za'farániyyah ("of Saffron"), and its eastern neighbour El-'Ajwah (the "Date-paste"). The latter measures 4-5 fathoms, and water appears under a boulder *in situ*, projecting from the southern side. Higher up the wady, a reef is laboriously scraped with Bedawi "Wusúm" and with Moslem inscriptions comparatively modern. Hereabouts, and to the north-east of the Fort, we picked up old and well-treated scorïa, suggesting a more ancient settlement. Perhaps it was the locale preferred by the owners of the slaves, who worked the inner mines hidden from view and from the sea-breeze by the hills.

*March 30th.*—We set out at 5.30 in disorderly "starting" style; and struck up the Wady el-Wijh, which now becomes narrow and gorge-like, with wells and water-pits, old and new, dotting the sole. Half an hour's walk led to the famous "written rock," which none of our guides seemed to know. Wellsted (ii. 189) erroneously calls the place "Wadí-l-Moyah" (Máyah), the name of a feature farther south. Moreover, he has copied the scrawls with a carelessness so prodigious, massing, in a single woodcut (p. 189), what covers many square feet of stone, that we failed at first to recognise his original. I deeply regret having republished this rubbish in 'The Gold Mines,' &c., p. 213. We (M. Lacaze and I) drew the inscriptions and the rude pictures as carefully as we could; and the former, on April 10, was sent back to photograph them.

Presently leaving the Wady el-Wijh, which extends for some 2 hours eastward, we struck E.S.E. up the left bank of the Wady Zurayb (زريب), of the "little Sheepfold"). This ugly rocky

torrent presently abuts upon an undulating plateau with low rises, almost bare of trees, bone-dry and utterly waterless. Raise it from 500 to 9000 feet, and it would be the model of a



Peruvian *cerro*. The material, porphyritic trap, everywhere showed scatters and large veins of quartz, mostly running north-south: large trenches, dug by the ancients; and small cairns, modern work, were also pointed out to us. Crossing the heads of the Wadys el-'Araykab (عريقب)\* and Fishayk

(فسيق), we fell into the Wady Umm el-Karáyát ("Mother of the Villages"), also called Umm Karáyát ("Mother of Villages"). Kar ("town") appears in the classics, at least if "Car-thago" be compounded of it; and Karyat, or Kiryat (plur. Kurá and Karáyát) is still used throughout Egypt and Syria, or, rather, wherever Arabic is spoken.

This wady begins, as is here the rule, with a gravelly bed; it then breaks into ugly rocky drops and overfalls; and, finally, the mouth becomes a matured copy, on a larger scale, of its head. Immense blocks of quartz garnish its base at the left bank. Presently a great white heap, some 200 feet high, capped and strewn with snowy boulders, rose above us; and in the watercourse at our feet lay the dark oblongs denoting the house-foundations of porphyritic walls. We had reached the celebrated Umm el-Karáyát, little expecting to finish the 4 miles' march of the guides in 2 hours 15 minutes (=  $6\frac{1}{4}$  miles).

The Jebel el-Marú (quartz-hill) showed, for the first time during the whole journey, signs of systematic and civilised work, shafts and air-holes, tunnels and galleries. The labour suggested Pliny ('Nat. Hist.,' xxxiii. 20), "*Tertia ratio opera vicerit gigantum. Cuniculis (galleries, tunnels) per magna spatia actis, cavantur montes ad lucernarum lumina,*" &c. Instead of being a regular round-headed cone, like the Jebel el-Abyaz, for instance, the summit is distinctly crateriform, the apex having "caved in," or rather, having been carried off bodily to be worked. *Negro-quartz* was abundant, but we came to the conclusion that the rock mostly treated was, like that of Shuwák, a very mauve-coloured schist, with a deep-red fracture and pleasing tender colours before they are oxygen-tarnished. It abounds in mica which, silvery as fish-scales, overspreads it in patches; and the precious metal had probably been sought in the veinlets between the schist and its quartz-walling. Two pieces showed specks, or rather *paillettes*, lightly and loosely adhering to the "Marú"—so lightly, indeed, that they fell off when carelessly pocketed.

Leaving the mining details for another place,† I will notice

\* It would be the diminutive of 'Urkub, which means besides the tendon Achilles, a winding track through a valley, or a narrow mountain-pass.

† See 'The Land of Midian (Revisited),' chap. xvi.

the topographical details of the "Mother of the Villages." A view from the summit of the decapitated, honeycombed mound gave us at once the measure of the past work, and a most encouraging prospect for the future. All around us lay a true quartz-region. The main hill projects a small southern spur, also showing traces of the miner; and the same is the case with the quartz-veined block of green trap to the south-west. There are detached white-yellow *pitons* to the north-east, the east and the south; whilst a promising hillock is appended to the north of the main outcrop. All have rounded conical summits and smooth sides, arguing that they are yet virgin; and here, perhaps, I should prefer to begin operations.

This Jebel el-Marú rises from the left bank of the wady, whose short gravelly reach is disposed north-west-south-east. The ruins, in N. lat.  $26^{\circ} 13'$ ,\* lie upon a fork where two gorges, running to the east and the north-east, both fall into the (northern) Wady el-Khaur (خور, "of the low ground") : our ca-

ravan ascended this line to-day, and to-morrow we shall descend it. The remains on the upper or eastern branch-valley show what kind of work was done, by a number of grinding implements—the common Mahrakah (محرآكه) or rubstone, and

the handmill, large and small, coarse and fine, all violently broken. In the south-western, which is the main valley, are the principal ruins, forming a rude parallelogram, disposed north-east-south-west. The ground-plan presents the usual formless heaps, squares and oblongs of stones and pebbles; and the general appearance is that of an *ergastulum*. Here perhaps the rock was crushed and smelted, especially that which was not worth sending down the wady, to be worked by water where the inland fort now lies.

During the day Lieut. Amir, guided by Nájí, set out to inspect some ruins to the south-west ( $240^{\circ}$  mag.). After a mile's ride, reported to be a dozen, he found a long-mouthed pit sunk some 4 fathoms in the trap hill-slope. Eastward of it, and at the head of the Wady Shuwaytanah (شويطنه, the "Devilling"), lay a square ruin like a small "Mashghal." Here also were three stones, scribbled in a modern Kufic with pious formulæ. The southern Wady el-Khaur was afterwards visited on April 9.†

I lost all patience with Wellsted, whose blunders became

\* The observations are all by Ahmed Kaptán.

† See Part III. sect. vi.

inexcusable. He makes (ii. 185) the inland fort "about three miles in the interior," whereas the distance is double. At p. 187 it becomes "five miles from the anchorage." He reaches these ruins after 10 miles from the Fort, whilst they lie 12 to 13 miles from El-Wijh. He calls the porphyritic trap "dark granite," noticing "the thin and shining white veins, which run either vertically or diagonally between the masses." But the grand quartz-formation is changed to "limestone." He descends the "caves" with ropes and lights; and he fails to understand that they are mining shafts and tunnels. The Ad. Chart, just as bad, after correctly placing the inland fort  $6\frac{3}{4}$  miles from the anchorage, thrusts the mine  $10\frac{1}{4}$  miles eastwards from the Fort, when the latter distance is about the same as the former. Moreover the ruins are laid down a little to the north, whereas they lie one mile south of the latitude of El-Wijh. It ignores the porphyritic sub-range, in which the "Mother of the Villages" lies; and it brings close to the east the tall peaks of the Tihámat Balawíyyah, which, from this point, rise like azure shadows on the far horizon. Lastly it corrupts Umm el-Karáyát to "Fayrabat."

In Ritter's 'Erdkunde' (von Asien, Edit. of 1847, West Asien, IV. Abtheilung, § 78, vol. iii. pp. 276-277) I find that the celebrated French Arabist, Fulgence Fresnel, afterwards Consul de France at Jeddah, visited "Wedjh-Albahr (Wijh el-Bahr), on April 28, 1844, long enough after Wellsted to have read his work.\* Accompanied by the Shaykh of the "Beli" (Baliyy), whom Ritter calls "Bily," a man who had guided Wellsted (?), he visited the ruins miscalled in the Admiralty Chart "Fayrabat" (our Umm el-Karáyát). Fresnel calls them Umm Foukhayyérât, which again he holds to be an inversion, *more Arabico*, for *Hhoufayyérât* ("excavations"), a diminutive form of "Hafirât." He also calls the valley Wady Fushaygh, the diminutive of Fushágh, a mistletoe-like plant which acts parasite to the mimosa. The Shaykh, who, like other Bedawin, feared evil spirits, assured him that the Englishman had descended the mine, and had carried off a human skull wrapped up in a cloth. All were careful before going down to show contempt for the ghosts by spitting over the left shoulder. Fresnel did not remark any signs of architecture, or of ruins, nor was a single hewn stone found near these caves (mines); but he observed the normal fragments of coarse glass like that of our bottles, and the many slags (*schlacken*), which seemed to show that here had been some mining-huts.

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\* Carless "Memoir," 'Proceedings Bombay Geographical Society.' Bombay, 1837. Wellsted's visit was in 1838.

In the Wady Zurayb (or Az-Zourayb), not far from the Hajj-station, Fresnel found the inscriptions which, I have shown, Wellsted places in the Wady el-Moyah, and Ritter seems (p. 277) to be puzzled by this difference of names. He locates them together upon a natural slab of rock extending 40 to 50 paces; they are either roughly scratched in or cut into the "granite" by hard stones like quartz. The characters numbering from 3, 4, to 12, refer apparently to one subject; some are disposed in straight perpendicular lines, or, where the rock did not give space, obliquely, and even horizontally, ranged one under the other. In the selection copied by Fresnel, each row separated by lines is complete in itself:\* the whole is accompanied by rude figures with horned beasts, as gazelle and ibex, like those brought from Sinai by Niebuhr (vol. i. Plate L.). The traveller seems to have thought that the characters are old-Phœnician or Nabathæan. He returned to El-Wijh without going farther inland.

*March 31st.*—We set out, at 5.10 A.M., in puffs of a warm wind that promised three days of the "Dufún;" and, leaving El-Karáyát by the upper (east) valley, fell into and descended its recipient the Wady el-Khaur el-Shimáli (of the north). On the right bank of this broad Fiumara rose the lesser "Mount of Quartz;" and for the next 2 hours (=7 miles) we saw on both sides immense veins and outcrops of "Marú." Presently these made way for a yellow-white heat-altered clay, often revetted with iron. The hills on either side of the valley form no regular line; they are detached pyramids of black, red, and rusty traps, here and there cliffing, as if in presence of the sea. With our advance the vegetation improved; the trees were no longer black and leaf-stripped, and the familiar growths presently reappeared. Shepherds' tents and flocks showed that water was not far off; and the young Baliyy women seemed to have no fear of the white face.

After a slow dull ride we crossed the head of our ugly acquaintance Wady Zurayb, did the same to the Tala' el-Nimr, and entered the Wady el-Kubbah ("of the Dome"), which finds its way through the Wady Zá'im (زاعم) to the sea. Before us

rose a grizly black saddle-back; and upon its tall northern end, the pommel, stands the promised "cupola." Rounding the block to the north, we followed the wady to the Máyat el-Kubbah, water-pits in the sand, whose produce had been truly reported to be salt, scanty and stinking. The path then turned

\* Under B, Fresnel gives the only two-lined perpendicular inscription: those labelled A and C are taken by Wellsted.

up a short broad branch-valley, running south-north, and entering the left bank of the main line: a few yards then brought us to a halt at the mines of El-Kubbah; and our morning's ride had lasted 4 hours (= 13 miles).

The ruins lie in the uneven quartzose basin at the head of their nullah, and the only peculiarity of the place is a broken-down Sâkiyah ("draw-well") with a basin of weathered alabaster. The rocks here worked were apparently the *Negro-quartz* and the rosy micaceous schist. Meanwhile the juniors ascended the Kubbah-hill (aner. 29·34) about 120 feet above the sole (aner. 29·46). The "dome" was nothing but a truncated circle of wall, porphyry and cement, just large enough to hold a man; and adjoining it was a rock-cut pit, some 15 feet deep. These look-out places are peculiarly Arab.

The caravan was sent forward to reach the only good water reported to be distant. We followed it, and, after half an hour, were led out of the Wady el-Kubbah, whose head, our proper line, lies to the north, with an eastern affluent, the Wady el-Dasnah (دثنه, of "little water"). Here we found the tents pitched near a large pit, the Máyat el-Dasnah, which lies in N. lat. 26° 23'. Our afternoon's ride was of 45 minutes (= 2½ miles); and the total was 4 hours 45 minutes (= 15½ miles), another day nearly half wasted.

*April 1st.*—The proverbial Fools'-day was a second that deserved marking with a white stone. We set out at 5.10 A.M., expecting to make the Umm Gezáz pits; but luckily I had ordered the water-camels to be loaded. From the Wady el-Dasnah we struck north, over the rim of low trap-hill, by a short cut, evidently artificial, and regained the Wady el-Kubbah. In 1 hour (= 4 miles) we reached its head, a fine round plain some 2 miles across; girt with red, green and black highlands, it was a replica of the Šadr basin. There was even a *Khuraytah* at the northern end, but this Col is a mere "bogus" pass, not leading to a raised plateau.

An easy metallated path crossed a shallow prism, and presently fell into the feeding-basin of Wady Musayriḥ (مسيريه). The latter led, by an ugly little gorge, to the broadest Fiumara we had yet seen, the Wady Sirr (سر),\* which, though far from its mouth, took us 45 minutes (= nearly 3 miles) to cross. We are now in the hydrographic area of the Wady Nejd, which was

\* Sirr, a secret, a mystery, would here mean the best part of a valley.

confounded by Wallin with the Wady Hamz some 40 miles to the south. Numbering influents by the dozen, it falls into the Wady Salbah (ثلبه) near Sharm Dumayghah. The guides call this Sirr "Asl el-Balawíyyah" (the old home of the Baliyy tribe). The view from its bed is varied and extensive. Westward lies the Tihámat Balawíyyah, the equivalent of the Gháts of North Midian between El-Zahd and El-Shá'rr; the items are the little Jebel 'Antar and the big Jebel Libn. In front (east) rise the pale-blue heights bordering the Wady Nejd to the north-west, and apparently connected with the Jebelayn el-Jayy (الجبي), far to

the north (30° mag.). To the north-east the view is closed by the lumpy Jebel el Kurr (the *Qorh* of Arabian geographers?), followed southwards by the Ward and the Safhah. For the last 18 miles we had seen no quartz, but now the Sirr-sole appeared streaked with snow; the stones are mostly water-rolled, the discharge of the watercourses. The ground was unpleasantly pitted and holed; and the camels, weakened by semi-starvation and the south-wester, kept their legs with difficulty.

Presently we struck up a short divide beyond the far bank of the Wady Sirr. It is strewn with glittering mica-schist that takes the form of rotten wood, and with purple-blue clay-slates, looking as if they had been worked. A counterslope of the same material placed us in the Wady Rubayyigh ("the little Rábigh," the "luxuriant in herbage," or "a green-grown spring"), a short broad branch draining to the Wady Sirr. Here large outcrops of quartz mingled with the clay-slate. A few yards farther, it abutted upon a small gravelly basin, with ruins and a huge white reef of "Marú," which caused a precipitate dismounting. We had marched only 4 hours (= 13 miles), and the Arabs congratulated us upon reaching a part of their country absolutely unvisited by Europeans.

The site of our find was the water-parting of the Wady Rubayyigh with the Wady Rábigh, both feeders of the Wady Sirr—this to the north, that to the south. The ruins are known as Umm el-Haráb (حراب); in classical Arabic this would mean "Mother

of the War," of Desolation; but the Arabs seem to understand by it "Mother of Notoriety." They are the usual basements, almost buried and swept away, occupying an utterly waterless basin, that lies west of the White Reef, Marú Rubayyigh. They bear nearly north of Umm el-Karáyát, in N. lat. 26° 33' 30"; and the altitude, by a mean of three observations, is upwards of 1000 feet above the sea-level (aner. 28·92).

At Umm el-Haráb we see, for the first time, an open mine

scientifically worked by the men of old. I must again quote Pliny (loc. cit.), whose valuable chapter is an epitome of Roman mine-craft: "Relinquantur itaque fornices (arches) crebri montibus sustinendis," &c. The workmen chose a pear-shaped quartz-reef, the upper dome exposed, the converging slopes set in green trap to the east, and the invisible stalk extending downwards, probably deep into earth's bowels. They began by sinking, as we see from certain rounded apertures, a line of shafts striking N.N.E. ( $45^{\circ}$ – $50^{\circ}$  mag.) to S.S.W., across the summit, which may measure 120 yards. The intervening sections of the roof are now broken away; and a great yawning crevasse in the hilltop, a saddle-back of bare cream-coloured rock, gives it the semblance of a comb or cresting-reef. For the details of the work; for the use of fire and water, which here took the place of the classic vinegar; and for the fine granite mills here used, the reader is referred to another volume.\*

In the evening we ascended the porphyritic hills to the north of the little camping-basin, and found the heights striped by two large vertical bands of quartz. The eastern had a north-east-south-west strike ( $45^{\circ}$  mag.), like the Jebel el-Marú; the western ran east-west with a dip to south. From the summit we could also see that the quartz mountain, as usual an exaggerated vein, was hemmed in on both sides by outcrops and hills of trap, black, green, and yellow, which culminated eastwards in the Jebel el-Guráb (جرباب). We had a fine view of

the Wady Rábigh, and of our next day's march towards the Shafah mountains: the former was white with quartz, as if hail-strewn.

Far beyond its right bank rose an Ash'hab (أشهب), ash-coloured, or "grey-head," which apparently promised quartzose granite—it will prove an important feature. Before sleeping, I despatched to El-Wijh two boxes of micaceous schist, and two bags of quartz, loads for a pair of camels.

IV. *To El-Badā.*—After the exciting scenes of the last two days we shall have some dull riding, and consequently, I fear, dull writing.

*April 2nd.*—At 5.10 A.M. we set off afoot down the rough line of the little watercourse draining the "Marú Rubayyigh" to the Wady Rábigh. We then crossed the latter, another of the short broad valleys which distinguish this section of South Midian. The bed-sides, especially the right, showed heaps and mounds of snowy quartz, with glittering crowns of rock and boulders, veins in the grey granites, whose large coarse ele-

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\* 'The Land of Midian (Revisited),' chap. xvi.

ments had been decomposed by weather. The aspect was peculiar; they seemed to pour from the dark rocky masses bordering the bed, and they looked like *Goz* ("sand-heaps") banked up by the wind. We then entered a lateral valley, *Khurm* (hole of) *el-Mahásh* (محاش); and a short divide led to *El-Bahrah* (بحره), a basin feeding the *Wady Sirr*.

Then began a long up-slope, with a longer counter-slope, the *Wady Mulaybij* (مليبيج), which gave us a prospect of *Jebel Raydán*, with its familiar head and dorsum. The watercourse, after forming a "round point," narrows to a gut, and presently debouches upon the broad *Wady el-Ghamís* (غميس). We crossed the latter diagonally, and fell into the equally wide *Wady Abá 'l-Gezáz* (قزاز); the name, probably a corruption of *Zujáj* (زجاج), would mean "Father of Glass," either from the ruins on its bank, or from the strews of quartz. This tributary of the *Wady Sirr* reminded us of the *Dámah*, with its fine vegetation of fan-palm, Daum-trees, asclepias, tamarisk, and wild castor-plant, whose use is unknown. Yet the Arabs complained that their camels found no forage. Water wells up abundantly from a dozen shallow pits, old or new, in the sand of the southern (left) bank. Here the flow is arrested by a tall rocky buttress.

Ending our short march of 4 hours (=  $12\frac{1}{2}$  miles) we camped to await the caravan, which had gone round by the *Wady Rábigh*, and for the benefit of the mappers. This place forms an excellent connecting-link between north and south. In the former direction we see the *Zigláb*-block of *Shaghab* bearing nearly north ( $350^\circ$  mag.), and the adjoining *Jebel el-Aslah*, also a blue cone on the horizon, about  $352^\circ$ : to south-east lies the *Jebel el-Kurr* (قر), along which we shall travel.

In the evening we found an *atelier* adjoining our camp, but apparently unknown to the guides, and we called it "*Mashgal Abá 'l-Gezáz*." The site is the slope of a trap-hill facing the *Wady el-Ghamís* and the "mesopotamian" plain below. Both highlands and lowlands are white-patched with mounds, veins, and scatters of quartz. This great line of valley was probably occupied along its whole length by many a settlement, whose very names are unknown. The same was remarked



of the Wady Dámah. Here we are about a day and a half's march from the sea.

*April 3rd.*—At 5 A.M. we struck up the Wady Abá 'l-Gezáz, loose sandy soil, so honeycombed that neither man nor beast could tread with safety. Animal life was unusually abundant, wolf, hare, porcupine and hedgehog; hawks, owls, and crows; pigeons and ringdoves, swifts and swallows; the water-wagtail and the merops; the hoopoe and the butcher-bird. Charred circlelets in the sand showed where alkali had been burnt for shipping at El-Wijh.

After 1 hour 30 minutes (= 5 miles) the "Father of Glass" changed his name to *Abí Daumah* ("Father of the single Daum-palm"). Porphyritic trap lay on both sides of us. To the right rose the Jebel 'Ukbul (عقب), whose grey head

(*El-Ash'hab*) we had seen yesterday; the four cones forming the south-western rim of the Badá saucer are known as El-'Akábil. Below these blocks the wady-sides are cut into buttresses of yellow clay, powdered with Šabkh, or impure salt. The water, when there is any, swings under the left bank, and forms two principal pools or holes. The Bedawin, failing to make us halt, declared that the pits had been buried, but the escort soon found them out. The Arab ever loves the night journey, enabling the camel to work in the cool hours, and to graze during the day: moreover both wild men and citizens are equally fond of "sitting up" and talking interminable "shop." The Mahattat (محطات) el-'Orbán, "the halting-place of the Arabs," is determined by water and forage, so as to vary from 5 to 25 miles. Consequently the Baliyy would reduce our stages to four hours a day, and they hate the regularity of our work.

Hitherto we had been marching south of east. Presently, where the pretty green Wadys el-Surúm (سروم) and el-Marwát fall into the left bank, we turned a corner, and saw before us (north) the great plain El-Badá. It is backed by a curtain so tall that we seemed, by a common optical delusion, to be descending, when we were really rising rapidly. The black range, El-'Akábil, had projected a loop of some 10 miles to be rounded, whereas a short cut across it would not have exceeded three. And now the wady abruptly changed formation, the red and green traps of the right side at once made way for grey and quartz-veined granites weathered to the quaintest forms. The basin is soled with sides comfortably metallised, and with falls of sand unpleasantly loose and

honeycombed. After a total of 4 hours 45 minutes (= 16 miles) we dismounted at the celebrated palm-grove of El-Badá (بدا).

The next day was devoted to inspecting the Bújat-Badá (the "wide plain of Badá"), as this choice site is distinguished by the Bedawin. It fulfils all the conditions required by the centre and head-quarters of Thamuditis. The position, topographically speaking, is a bulge in the Wady Nejd, before it becomes the Wady Abú Daumah, between the Shafah Mountains to the east, and the Tihámah range seawards. The latitude (Ahmed Kaptán's observation of Polaris) is  $26^{\circ} 45' 30''$ , Ptolemy being as usual low (N. lat.  $25^{\circ} 30''$ ): thus it is  $0^{\circ} 31' 30''$  north of El-Wijh. From a little way south of our camping-ground the Jebel Zigláb bears  $32^{\circ}$ , and the Aslah cone  $30^{\circ}$  (both mag.). It lies, therefore, south of Shuwák, with a little westing, and Yákút (iii. 302) makes it one day's march from "Shaghba" (Shaghab). The altitude is upwards of 1200 feet above the sea (aner. 28.72, the mean of six obs.). The size of the oval is about 9 miles (statute) from north to south, by 12, an area of some 108 square miles. The general aspect of the plain suggests that of El-Haurá. The growth is richer than the northern, but not equal to that of the southern country. The ruins belong to the Magháir Shu'ayb category, and the people compare the "Hawáwít" with those of Madáin Sálíh. Such is the great station on the Nabathæan highway between Leukè Kóme and Petra; the commercial and industrial, the agricultural and mineral centre which the Greeks called *Bedais*, and the Romans *Badanatha*. In the days when the Hajj-Caravan used to descend the Wadys Nejd and the "Father of Glass," it was known to Arab geographers as the Badá Ya'kúb, that now forgotten patriarch being supposed to have visited it from Egypt or Syria.

The Bújat Badá is floored with grey granite, underlying a modern sandstone, which, not unlike coral-rag, served for building purposes. Through this crust outcrop curious hillocks, or rather piles of hard, dark-red and iron-revetted rock, with a white or a rusty fracture. They form the characteristic features of the basin. The lower levels are furrowed, as usual, with thin threads of sand by the rain-torrents discharged from the mountains. The Shafah curtain to the north breaks into a number of peaks named after their wadys. Beginning from west are Jebels Sehayyir (سحير), 'Unka (عنقا, the Griffin), Marakh (P. N. of shrub), Genayy (جنى), El-Hazzah (حضة), El-Madhanah (مدھنه), Buza'mah (بضعمه), and Urnuwah

(ارنوة). The west lies open, with a great slope to the Wady Manab (منب), the breadth being broken only by the remarkable saddle-back "Nagrâh Naza'ân" (مقراج نزعان),

which we have seen during the last three marches. A little south of east appears the gorge-mouth of the Wady Nejd, a jagged black curtain, the Jebel Dausal (دوثل), forming its southern

jaw. Farther south the Tihámah Mountains begin with the peaky Jebel el-Kurr; its neighbour is the Jebel el-Wásil of Marwât, and the Jibál el-'Akábil end the circle.

I will briefly catalogue the notabilia of El-Badâ as follows; full descriptions will be found elsewhere.\*

1. The hillock to the north-east of the Date-grove, known by three names, El-'Araykat (عريقة a little irk or vein),† El-Zaba'at (from ضباء Zaba'a, the low-lying), and Shahíb (شهب) el-Búm, the "ash-coloured (hill) of the Owl." Here are a main road, the chief quarry, a look-out, and rocks inscribed with prayers in Kufic and more modern characters.

2. The ruins, containing a fine tank, a conduit, a graveyard, whose yawning graves supplied two skulls, and scatters of spalled quartz. The Baliyy declare that the latter comes from a "Mountain of Marú" northwards (350° mag.), where also lies a Zaríbat el-Násará, or "Enclosure made by Nazarenes."

3. The palm-orchard on the left bank of the Thalweg, which overflows it during floods. The enceinte is the normal snake-fence, defending the nurseries of young trees and the plots of Khubbayzah (*Malva rotundifolia*, edible mallows). The wells inside and outside the enclosure number nine; three are rudely revetted with stone, and the others mere pits in the grit. The trees want thinning, but the heads are all carefully trimmed—an unusual sign of industry. The shade attracts vipers, and I was startled by hearing the gay warble of the bulbul—a nightingale in Arabia!

4. The Tell el-Ahmar ("red hill"), alias Ja'dat Badâ ("curved hill of Badâ). This quoin of grey granite, with a red back, shows a made zigzag, a heap of ruins, and an apical look-out.

5. To the south-east of the palms lies the pile called El-

\* 'The Land of Midian (Revisited),' chap. xviii.

† El-'Araygât in the plural is not an uncommon name.

Huzaybat (هضبة, or isolated hillock). On the plain to its north are ruins, probably of a work intended to defend the eastern approach, and to the south appear the usual signs of an *atelier*.

To conclude. The beautiful Bújat Badá has, according to the Baliyy, seen worse days. About twenty years ago, however, the wells were reopened, and the date-trees were replanted. As for its future, we may safely predict that, unless occupied by a civilised people, the fair basin will again come to grief. Nothing would be easier than to rebuild the town and to prepare the plain for cultivation, but destruction is more in the Bedawi line.

V. *To Marwát and the Wady Hamz.*—Before leaving El-Badá I was careful to make all manner of inquiries concerning stone-coal; and the guides confirmed the suspicions which had long suggested themselves. It is an old story. El-Mukaddasi (p. 103) has the following passage unconnected with those which precede and follow it. "A fire arose between El-Marwat and El-Haurá; and it burned even as charcoal (*el-fahm*) burns." Prof. Sprenger—who, by-the-by, first brought to light the MS. published by Prof. de Goeje in his '*Bibliotheca Geographarum Arabicorum*'—probably read "and it (the stone) burned as charcoal burns;" suggesting that the houses and huts were built of some inflammable material, like the bituminous schist of the Brazil; and that the Arabs were surprised to see them taking fire. Evidently, however, the text refers to an eruption in one of the many volcanic districts (*Harrahs*). My learned friend writes to me in June 13, 1877, "it is likely that west of Marwa, on the way to Hawrá (which lies on the seashore), coal is found. I confess that the prospect of discovering much coal in Arabia does not appear to me very great; still it would be worth while to make inquiries." Subsequently (December 8, 1877) he gave up all hopes of the pure mineral; but he still clove to inflammable matter.

At El-Wijh, I consulted the Wakíl Mohammed Shahádah. In past times he had sent for a camel-load of the stuff; but, he declared, it would not take fire. He then travelled in person to the Jebel el-Muharrak ("burnt Mountain"), which he places 5 short marches inland from El-Badá, and behind its northern curtain, the Jibál el-Shafah. According to him, El-Muharrak is part of the great Harrah; and El-Jaww, which stretches north (?) of it, is a prolongation of the Hismá plateau, here belonging to the Baliyy. The mountain is tall and black: near its summit lies the Bir el-Shifá ("Well of Healing"), a pit of cold sulphur-water, excellent for the eyes and generally

a Pool of Bethesda for suffering Arab humanity. Shaykh 'Afnán, whose tents are pitched one day ahead of us, confirmed these statements, adding that the Shafah Mountains are a mere ridge, not the seaward walls of a plateau; and that the land east of them is exactly that which we have already traversed. He spoke of brimstone being picked up on the hill-flanks, and he had heard of El-Kohl (Stibium or Collyrium) being found about El-Muharrak. At Wady Abá 'l-Gezáz, Mohammed destroyed all our surviving hopes by picking up a black stone which, he said, was the object of our search. Schist with a natural fracture not unlike coal, and weathered into the semblance of wood, it unfortunately did not contain an atom of bitumen. I have too much faith in Arab acumen to reject the lesson.

*April 5th.*—At 4.45 A.M. we took the track which crosses the Bújat Badá to the south-east. For a few yards it is vilely rat-eaten; presently it issued upon stony ground; and, after 1 hour 15 minutes (= 4 miles), it entered the Wady el-Marwát, a vulgar gorge, broad, rough, and unpicturesque, marked by a round head to the north, Jebel Wásil (واصل), “that joins or connects.” The sole shows several dry-stone piles, ruins of “boxes” in which the Arab traveller passes the night, whilst his camels are tethered outside. Crossing the mouth of the Wady Nakib el-'Arús, which drains the hill of the same name, to the Wady el-Marwát, we entered the upper course of the latter. After a total ride of 3 hours 45 minutes (= 11 miles), we reached its head, a “Khuraytah” rising some 2100 feet above the sea-level. “Marwát,” as the Baliyy called it, shows worked veins of snowy quartz, a few ruins which supplied me with a Kufic inscription, and a fine reef of “Marú,” 8 feet wide, and trending 332° (mag.).

From the Col two roads lead to our nighting-place. Rejecting, on account of our unshod mules, the short cut to the right, reported as rough and stony, we followed the long slope that led to the Wady Zikah (ضيقة), and eventually to the Wady el-Kurr, draining the block of that name to the Wady el-Miyáh. Despite the many Zawábahs (dust-devils) we pushed on for another 1 hour 30 minutes (= 4½ miles), and a total of 5 hours 15 minutes (= 15½ miles), before halting to break our fast. Resuming the way after the usual hour, we rode down the valley, meeting only a few men driving asses; and presently we sighted the grand “Gate” of the reach, here running north-south. The material is porphyritic trap, red, green, yellow, and white, with argile, almost enveloping the rounded

bulging blocks of the quartz-veined granite that outcrops on the sides and summits. The peaks are high enough to give shade between 8 A.M. and 2.15 P.M.

In 1 hour 45 minutes (= 5 miles), and a total of 7 hours (= 20½ miles), we encamped at the beautiful 'Ayn el-Kurr; and the caravan was only one hour behind us. A sole of the cleanest sand is dotted near the right side, with pools of the sweetest water, surrounded by "bulrushes" (*Arundo donax*). reeds, and yellow-tipped flags; farther off are natural plantations of the tobacco-like *Verbascum*; scattered clumps of date-trees domineering clumps of fan-palm; and, lastly, marvellous to behold in North-western Arabia, a few hundred feet of green-sward. I expected to find many traces of the "Old Ones," and saw nothing but a few graves, a rude modern watercourse, and the normal Arab fence.

During the evening the Shaykhs, with very long faces, assured us that we were about to enter a dangerous frontier-region infested by robbers, and opened to the Gaums (razzias) of the 'Anezah and the Juhaynah. Furayj, when privily consulted, said that such things may happen; so I prepared for eventualities by a firing parade, which went off well; and gave orders for marching *militairement*. It is no joke to follow starveling beasts whose best pace is 2½ miles an hour, but the effect is excellent.

*April 6th.*—At 5.15 A.M. we set off, in rear of the caravan, down the Wady el-Kurr, which bade fair to be as flat and uninteresting as possible. After 55 minutes (= 2 miles) we passed the mouth of our old friend the Wady el-Ghamis (of "green grass"); sketched the "Wasm," on the rocks to the left; and took bearings of the pyramidal Jebel Abú Buraydiyyah; the latter marks the southern bank of the Wady el-Miyáh, and of the Jebel Muwayrib, which separates us from the Wady Sirr. Suddenly I caught sight of minerals, veins, and strews of quartz garnishing the left bank. Then turning south, and passing the brackish well, El-Hufayrah (حفيرة, the "little Pit"), in a baylet of the left flank, we saw the whole valley-sole, here some 2 miles broad, barred with quartz. The strew overlay gravel of the same rock, and veins, protruding from the dark schist, suggested that it underlies the whole surface. Nothing more remarkable than the variety of forms and tints mingling in the mighty mass; its richest part is called the *Magráh el-Kabsh* ("Divide of the Ram"), where the Wady el-Kurr flows down the left side of its valley, and falls into the Wady el-Miyáh. After a total of 3 hours 15 minutes (= 8 miles), we dismounted, and passed a quarter of an hour collecting specimens.

Leaving the curious white divide, we file into the Wady Gámirah (جامره), with the dwarf range of the same name on the right bank; it is also an affluent of the Wady el-Miyáh. After 1 hour 45 minutes (= 4 miles), we halted for rest, resuming our march at 11.45 A.M. down the bed. A short divide then placed us in the Wady Samad, which belongs to the same basin. The Shaykhs then led us over another water-parting to the Wady el-Laylah, which drains both the Shafah and the Tihámah ranges: the line lies too far east; we should have followed the western Wady el-Tufayyah (طفية),\* in which ruins are said to exist. However, we had no reason to repent. Hills of "Marú" now appeared on either side, creamy-coated cones each capped by its own sparkle, whose brilliancy was set off by the gloomy traps which they sheeted and topped. In some places the material may have been the usual hard, white, heat-altered clay; but the valley-sole showed only pure quartz. The height of several hills was nearly double that of the northern Jebel el-Abyaz, and the reef-crests were apparently unworked. We rode on for 2 hours (= 6 miles), making a total for that day of 7 hours (= 18 miles), when we were begged to halt in the broad, open, and waterless Wady Laylah.

*April 7th.*—At 5 A.M. we resumed our way up the Wady Laylah, which here makes a large bend to the north, whereas our direction was to the south-west. Having heard of a short cut to the west, a continuation of the Wady Tufayyah line, I set out on foot in the latter direction; Abdullah, the Mulatto, shouted "Wa'r" ('Ware rocks!'); but this was "crying wolf" for the second time. After a steep descent, without difficulty to loaded camels, we hit the little Wady Zuraydim (زريد), a

feeder of the Wady Laylah. Here the line forks. I tried the southern section or up-stream, which would indeed have been a short cut: unfortunately it ended in a wall of rock, the Sha'ab Abú Siyál. A water-pool explained the meaning of the broad footpath which had deceived me. After losing 10 minutes, we retraced our steps, and, following the northern fork, at 6.30 A.M. (1 hour 30 minutes = 5 miles), we regained the Wady el-Laylah in time to see the caravan, which had taken the longer line, pass in review before us.

At this point the Wady el-Laylah changes name to the Wady el-Birkah ("of the Tank"); and we shall follow its course till

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\* The classical Tufyah is a "malignant serpent, marked on the back with two black lines."

received into the mighty arms of the Wady Hamz, some 3 miles from the sea. This upper part commands fine views of the Jibál el-Safhah (صفحة), the "Mountains of the Plain," so-called from their rising suddenly out of a dead level. Seen beyond the dull traps that hem in our wady, the noble blocks, especially the lower features, the mere foothills, assume every quaintest variety of hue and form. The fawn-grey ground-colour of the granite, here shining as if polished by "slickensides," there dull and roughened by the rude ungentle touch of Time, is a neutral tint that takes every glazing with which sun and moon, mist and cloud paint the world. Changeable as the chameleon's, the coating is never the same for two brief hours. The protean shape, seen in profile and foreshortened, from the north or south, appears as blocks bristling with "pins" and points, chimney-tops, horns, and beaks. Viewed from the east the range splits into a double line, whose ranks have never been "dressed" nor sized; whilst a diagonal prospect so alters their features that they seem to belong to another range.

After much time wasted in ascertaining the names of the several items, I give them as they were told to me, declining, however, to answer for their correctness. The principal blocks number three; the two first are in the Safhah and the third lies south of it.

1. The *Jebel el-Ward*, a white-streaked and regular wall visible from the sea. It is separated by a broad valley from its southern neighbour; and its outliers are the pale-white and jagged *Jebel 'Afayr* (عفير)\* and the long and lumpy, low and dark *Jebel Tufayyah*.

2. The *Ghalab* (غلب) or Ughlub, a monstrous "Parrot's Beak" of granite, continued by a long dorsum to the south. Its four outliers are the *Jebel Natash* (نتش), † perpendicular buttresses pressed tightly together; the *Tala't Muhajjah* (طلعت مهججه), a broken saddle-back with two monstrous towers; the *Jebel Umm el-Natakah* (نطقه), all blocks and blocklets, bristling like the fretful porcupine; and lastly, the *Jebel el-Khausilah* (خوسله), in appearance thoroughly architectural.

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\* El-Ufayr was the name of the ass ridden by Mohammed.

† The dictionaries explain Natash as the "herb gromwell."



3. The *Jibilayn el-Rál* are separated from the Khausilah by the Wady Hamz; these two conical peaks are divided and drained by the broad Wady el-Sula' (صلح), down which the Egyptian Hajj, returning northwards from El-Medinah, debouches upon the maritime plain of South Midian.

Presently falls in a remarkable influent from the left or east, the Wady el-Nábi' (نابع), garnished with a long line of Daum-palms, and the main line bends from north-east to south-west. After riding about 3 hours 30 minutes (= 8 miles) we reached the Birkah, where the great wady narrows and forms a river-like run about  $1\frac{1}{2}$  mile long. The large blue-green pool on the right side is set in dense beds of rushes, which shelter a variety of water-fowl; about the run are dwarf enclosures where even water-melons have been sown. Whilst the camels drank, we halted for a few minutes under the masses of trap which wall in the left bank; and then we pressed forwards down-stream, following the threads of fluid. Farther on was another fine "Gate," whose right jamb was the Jibál el-Tibgh, fronting the Wady M'jirmah. The narrows showed two Arab wells; and there was no break in the continuity of the quartz. Having travelled down sundry bends, we halted under the usual thorn at 11 A.M.; thus ending a second stage of 2 hours (= 6 miles). Here a fine *Cerastes* was brought to me.

The Shaykhs were anxious to push on for another 30 minutes to a rain-pool which they reported in the ravine Sha'b el-Kahafah (كهف); but we had been told of another in the Sha'b el-Hárr, which might serve our photographer. The result is curious, showing how jealously water-secrets are kept in these lands. The next thing I heard was that the water had waxed salt, then it had dried up; and, lastly, it was in the best possible condition, the truth being that there was none at all. Consequently we were obliged to send back four camels and two men from our next camping-ground to the Sha'b el-Kahafah. Resuming the road at 2.30 P.M., we entered the western Wady el-Birkah, which here, finally, becomes the Wady el-'Ajáj (عجاج, "of Dust"). In 2 hours 15 minutes

(= 6 miles), and a total of 7 hours 35 minutes (= 20 miles), we camped at a noble reach and enjoyed a glorious night.

*April 8th.*—There were differences of opinion concerning the stage ahead. Lieut. Amir's map made it 11 geographical miles

long; the Arabs said 4 hours; the Frenchmen 10 hours, and the moderates 6 hours—even they were 45 minutes too slow. Setting out late, at 5 A.M., delayed by the Shaykhs and too much whisky, we reached in 30 minutes a lower and a larger bulge of the bed, whose water is known as Mâyat el-Badî'ah (بدية, the "Wonderful"). At 6 A.M. (1 hour =  $3\frac{1}{2}$  miles) we ended the hilly encasement of the Wady with El-Adrá (عدر, the "Rainy"), a red *butte* to the left, and, on the right, a quartz-veined green knob, the J. el-Yakhmúm (يخموم). Though 400 feet above sea-level, the land commands no sea-view, and yet there is nothing monotonous in it. To the south lies the boundary line Ras Kurkumah ("Turmeric Head"); the Jebel el-Birák'h rises to the left beyond the raised bank of the great Wady Hamz, which, sweeping with a mighty curve from north-east to west, stretches across our path. Knobby hills are scattered over the plain; and on our right appears the Jebel el-Juwayy (الجوى) the "unwholesome"),

a black mound with white-sided and scarred head, whose peculiar shape—a crest upon a slope—represents once more the familiar Secondary formation of north-western Arabia. Thus the gypsum has been traced from the Sinaitic shore as far south as the Wady Hamz, and doubtless it does not end here.

At 7.35 A.M. (2 hours 35 minutes = 8 miles) we crossed a winding, broad and spreading track, the upper road by which the Egyptian "Mahmal" passes, when returning *viâ* the Wady Hamz from El-Medinah. A few yards farther on showed us a similar line, the route taken by the caravan when going to Meccah *viâ* Yambú'. The two meet in the Wady Wafdiyyah (وفدية),\* to the north-east of the site which we shall visit to-morrow.

A little past 10 A.M. (5 hours 15 minutes =  $16\frac{1}{2}$  miles), we crossed the deepest vein of the Wady Hamz, and reached the Gasr ("Palace") of Gurayyim Sa'id—Sa'id the Brave.

Our march to the farthestmost southern point of Egypt-land had lasted 11 days (March 29–April 8) without including the single halt (April 4), and the two days' march re-

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\* "Wafd" is the summit of a sandy hill.

turning to El-Wijh. The following is a list of stations and dates:—

1. March	29.	El-Wijh to Inland Fort .. ..	1 h. 45 m. = 6 miles.
2. „	30.	To Umm el-Karáyát .. ..	2 h. 15 m. = 6½ „
3. „	31.	„ Máyat el-Dasnah .. ..	4 h. 45 m. = 15½ „
4. April	1.	„ Umm el-Haráb .. ..	4 h. 0 m. = 13 „
5. „	2.	„ Abá'l-Gezáz .. ..	4 h. 0 m. = 12½ „
6. „	3.	„ El-Badá .. ..	4 h. 45 m. = 16 „
		4. Halt at El-Badá.	
7. „	5.	To Marwát and 'Ayn el-Kurr ..	7 h. 0 m. = 20½ „
8. „	6.	„ Wady Laylah .. ..	7 h. 0 m. = 18 „
9. „	7.	„ Wady el-'Ajaj .. ..	7 h. 35 m. = 20 „
10. „	8.	„ the Gasr (Wady Hamz) .. ..	5 h. 15 m. = 16½ „
Totals .. ..			48 h. 20 m. = 144½ „

VI. *The Palace of Sa'id the Brave ; The Mine of "Marwah."*—For architectural details concerning the "Gasr," I must refer my readers to another place.\* Here its geographical position only will be described.

The site of this classical building, the sole remnant of its kind found during the four months of exploration, lies in N. lat. 25° 55' 15" (Ahmed Kaptán's solar observation); and the centre of the "Libn" block bears from it 339° (mag.). It stands upon the very edge of the Wady Hamz's left bank, a clifflet some 25 feet high, sloping inland, with the usual dark metal disposed upon loose yellow sand. Thus it commands a glorious view of the tree-grown valley, or rather valleys, beneath it; and of the picturesque peaks of the Tihámat Balawíyyah in the background. The distance from the sea is now a little over three miles—in ancient days it may have been much less.

The condition of the digging proves that the remains have not long been opened: the Baliyy state less than half-a-century ago, but exactly when, or by whom, are details apparently unknown to them. Before that time the locale must have shown a mere tumulus, a mound somewhat larger than the many which pimple the raised valley-bank behind the building. As at Uriconium, a wall is said to have projected above ground; this may have suggested excavation, besides supplying material for the Bedawi cemetery to the south-west. The torrent-waters have swept away the whole of the northern enceinte, and the treasure-seeker has left his mark upon the interior. Columns, and pilasters, and cut stones, morticed and bevelled, have been hurled into the wady below; the large pavement-slabs have

\* See 'The Land of Midian (Revisited),' chap. xix.

been torn up and tossed to a chaos; and the restless drifting of the loose desert-sand will soon bury it once more. The result of all this ruthless ruin was simply nil; the imaginative Nāji declared that a "stone-dog" had been found, but what had become of it nobody knew.

The "Palace" is a Roman building of late style, but whether Nymphæum or Heröon, temple or tomb, we had no means of ascertaining. It must have been a bright and brilliant bit of colouring in its best days: hence possibly the local tradition that the stone sweats oil. The Baliyy declare that the quarries are still open at Abú Makharír under the hills embosoming Abá 'l-Marú: the whole ruin, from pavement to coping, a square of 27 feet, is of alabaster, plain white, and streaked with ruddy, mauve and dark tints, whose mottling gives the effect of marble. Although the Meccan Ka'bah is, as its name denotes, a cube, the workmanship of this square box is too careful to suggest either Arab or Nabathæan origin. Perhaps an investigation of the ruins at Ras Kurkumah, and the remains of Madáin Sálîh may throw some light upon the mystery. At present I can only suggest that it is a *Naós* or shrine, evidently a remnant of the days when the Romans held the whole country as far south as El-Haurá.

The town probably stood on the left bank of the Wady Hamz, to judge from the many mounds which rise behind the "Gasr." I opened one of these tumuli, and found the interior traversed by a crumbling wall of cut alabaster—regular excavation may some day yield important results. A Bedawi cemetery, adorned with the mutilated spoils of the classical building, adjoins it, and here we picked up two imperfect skulls and four fragments. Not a word of inscription, not a mason's mark was to be found. A little to the south-west lies a manner of ossuary, a tumulus slightly raised above the wavy level, and showing a central pit choked with camels' bones. This is a memorial of a certain

Sa'id, surnamed *El-Gurayyim* (قریم), a word derived from the root *Garam* (Karam), *i.e.* "having an insatiable appetite for a flesh diet;" the vulgar understand by it a stout fellow, a brave fighter. At first I thought it was derived from Jarím (جریم),

a large-bodied man, but no one wrote it after that fashion. This negro was promised his owner's daughter in marriage by way of reward for some doughty deed; when difficulties were made he carried off the girl, and built this "Palace" by way of a home. He scandalised the neighbourhood, however, by plundering the

herds and eating a camel every day, till at last he was slain by the followers of Diyáb ibn Ghánim, one of the notables celebrated in a romance called 'Sirat Abú Zayd.' \*

*April 9th.*—On the finest possible morning, when the world was all ablaze with living light and rosy flame, we walked down the immense watercourse known universally in these parts as the Wady Hamz (حمض). The root has a signification of "sourness," and gives origin to such branches as *Humayzah* ("Sorrel") and so forth. The watercourse, which has already been mentioned as the southern frontier of Egyptian Midian, and the northern limit of the Ottoman Hejaz, is the most notable feature of its kind upon the north-western Arabian shore. Yet Sprenger clean ignores the name, although he mentions its branches; and, of course, it is utterly neglected by the Admiralty Chart. Wallin has unjustifiably described and inscribed it "Wady Nejd," † confusing it, as we have seen, with a northern basin, whose mouth the Salbah (Thalbah) we passed before reaching Sharm Dumayghah. His account of it (pp. 321-23) is marvellous, but excusable because he derives it from the Bedawin. In the first place he describes it as a "large valley which, continuing in a south-easterly direction, descends towards the interior of Arabia," in fact flowing upwards. Secondly he reports it as "descending in a direction to Wegh (El-Wijh), and in another towards Medíná," thus half flowing one way and half another; prudently adding, "not having visited that part myself, I cannot accurately define its course." He also makes it "run along the southern side of the Harrah Mountains," which extend nearly a hundred miles to the south; and he depicts "al-Gaww" (El-Jaww) as an "extensive plain of sand like the Hismá" (true), but also "the southern and almost only inhabitable part of the Harrah"—confusing a sandy with a volcanic tract. Afterwards he determines the Wady el-Kurá, concerning which Arab geographers give such discrepant accounts, to be a valley "whose mouth is at El-Wijh and its head at El-Hijr;" and such garbled description can apply only to the Wady el-Hamz.

This main approach to the Arabian interior is not a fissure, like the vulgar wady, but rather a broad *campo* opening to the north-east, where the maritime chain breaks to the north and south of it. Distant one long or two short marches from El-

\* For a sadly superficial account of the latter see Lane's 'Modern Egyptians,' III. chap. xxi.

† Besides our Wady Nejd, Burckhardt (p. 418, 'Travels in Syria,' &c.) describes a northern feature of the same name near Shobak. The term is common enough in Arabia, meaning the "watercourse that drains the Nejd or uplands."

Wijh, its mouth is in N. lat.  $25^{\circ} 55'$ , and it is said to head fifteen days inland, in fact beyond El-Medinah, from which it curves with a south-westerly bend. It receives a multitude of important secondary valleys. Amongst them is the Wady el-'Uwaynid, universally so pronounced. I cannot help thinking that this is El-'Aúnid of El-'Mukaddasi, which El-Idrisí (erroneously?) throws into the sea opposite Nu'mán Island. If my conjecture prove true, we then have a reason why this important line has been inexplicably neglected. "El-'Uwaynid" is not an uncommon name in this part of Arabia. Wallin (p. 311) describes a "Wádi 'Uweinid" which debouches upon the Hismá plain: here he found sundry inscriptions (see my Vol. I. p. 210). Another branch is the Wady el-Is (عيس), Sprenger's "Al-'Yç" (pp. 28–29), which he calls "a valley in the Juhaynah country," and makes the northern boundary of that tribe. The word is written with a "Sín" and not with a "Sád" (عيس), and pronounced like "Greece" without the Gr. *Klingt für den Fremden Ayz*, says Sprenger (p. 154), speaking to the German stranger. He mentions two others of the same name, one in the Yambú' country, not far from the Red Sea, and connected by history with the Apostle of Allah; and the second (No. 3) in the Lands of the Sulaym above El-Suwárkiyyah.

Ethnologically considered, the lower Wady Hamz is now the southern boundary of the Balawíyyah (Baliyy country), and the northern limit of the Jahaníyyah or Juhaynah-land, the latter popularly described as stretching down coast to Wady Burmah, one march beyond Yambú' (?). Higher up it belongs to the "Alaydán-'Anezahs under Shaykh Mutlak—these were the Bedawin who, during our stay at the port, brought their caravan to El-Wijh. Both tribes are unsafe, and they will wax worse as they go south. Yet there is no difficulty in travelling up the Hamz, at least for those who can afford money and time to engage the escort of Shaykh Mutlak. A delay of twelve days to a fortnight would be necessary, and common prudence would suggest the normal precaution of detaining one of his Alaydás as hostage in the seaboard settlement. Wallin does not mention this clan; he writes only the Wuld Sulaymán; the Bishr and the Wuld 'Ali; who, with their chief sept, the Beni Wahab, occupy the country between Hijr, Tabúk, Taymá and Khaybar. Water is to be found almost the whole way,\* and the usual provisions are to be bought at certain places.

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\* From 'Ilá to Taymá, meaning a solitude or desert,  $2\frac{1}{2}$  days in a north-easterly direction, there is said to be no water, except in rain-pools and cisterns.

The following notes upon the ruins of the Wady Hamz were supplied to me by the Baliyy Bedawin, and the citizens of El-Wijh. Six stages up the lower valley, whose direction lies nearly north-east, lead to El-'Ilá (عَيْلَا), Wallin's "Ela," Niebuhr's 'Olá, and Burckhardt's El Olla. The place, which belongs to the 'Anezahs, is described as resembling Tabúk on a small scale, many of the people being mulattos who trade with El-Wijh, El-Medinah, and Yambú'. According to Ahmed el-Dimishkí (*Akhbar el-Duwal*, the "Notices of Kingdoms,"\* finished in A.H. 1008 = A.D. 1599), it is a village on the Syrian pilgrim-road, five days' march from El-Medinah, and situate in a wady possessing date-plantations, and a spring of running water. Now, however, the highway runs about 6 hours (= 18 miles) to the north-east of the settlement. Burckhardt (*loc. cit.*, Appendix iii. p. 660) notices only "its rivulet and agreeable gardens of fruit-trees."

From El-'Ilá a short day to the north, with easting, places the traveller at El-Hijr on Madáin (not Madyan nor Medínat) Sálíh, the fourth pilgrim-station from Tabúk. The site of the city is described to be somewhat off the main valley, which is here broken by a "Nakb" (?); and those who have visited both, declare that it exactly resembles Nabathæan Magháir Shu'ayb in extensive ruins and catacombs covering the hill-sides. The name Madáin ("cities") is a plural of Midyán, more commonly Madínah; not a dual as some travellers make it; and it reminds us of the title given by Mesopotamian Arabs to the twin settlements Madáin el-Kisrá (the cities of Chosroes), Seleucia and Ctesiphon on Tigris' banks.

Also called El-Hijr, this city is made by Sprenger (p. 20) the capital of Thamuditis. The latter province was the headquarters of the giant race called the "Sons of Anak" (Joshua xi. 21); the Thamudeni and Thamudæ of Agartharkides and Diodorus; the Tamudæi of Pliny; the Thamydite of Ptolemy, and the Arabian Tamúd (Thamúd) who, extinct before the origin of El-Islam, occupied the seaboard between El-Muwaylah and El-Wijh. Their great centre was, I have shown, the plain El-Badá, and they were destroyed by a mysterious and terrible *vox* from heaven, the Beth-Kol of the Hebrews, after sinfully slaughtering the miraculously-produced camel of El-Sálíh,† the Righteous Prophet (Koran, cap. vii.). The exploration of "Sálíh's

\* In the "Notes to Dr. Wallin's Route in North Arabia," 'Journal R. G. S.' vol. xx. p. 343, the title is translated 'The History of the Changes of Fortune.'

† Prof. Palmer (*loc. cit.* p. 52) "fancies," and with considerable power of fancy, that "we may recognise in the tradition (of the she-camel produced from the rock) a distorted reminiscence of the history of the Israelitish law-giver himself."

cities" will be valuable if it lead to the collection of inscriptions sufficiently numerous to determine whether the Tamúd were Edomites or kin to the Edomites; also, which of the two races is the more ancient, the Horites of Idumæa, or the Horites of El-Hijr.

Between the "Palace" and the sea, the Wady Hamz is liberally supplied with water: the whole vein (*Thalweg*) subtending the left bank would yield to tapping. The well "El-Kusayr," just below the ruin, contained till late years a large quantity: about half a mile to the westward is, or rather was, a saltish "Hufrah" surrounded by four sweet pits. Almost all are now dry and filled up with fuel. A sharp walk of 45 minutes leads to the Bir el-Gurnah (قرنه), or "Well of the Corner," in a district of the same name lying between the ruin and the shore. It is a great gash in the sandy bed; the taste of the turbid produce is distinctly sulphurous; and my old white mule stedfastly refused to touch it. The distinct voice of the Red Sea told us that its shores were not more than a mile distant.

From the well we struck north-east over the Sabkhab, or salt maritime plain, white with efflorescence; grey where dry, and chocolate-coloured where damp. Hard on our right was the well-wooded Wady el-Zuhayr (ضهير), which flows to the sea united with its northern neighbour Wady el-Marrah. To the left was a sand-strip profusely grown with the pink and white sea-lavender (*Statice*), and with clumps of the salsolaceous tree, enjoyed by camels: the Arabs call it *Shorá*, or *Ishrirah* (اشريره); and here, like the African mangrove, it forms regular "forests of the sea." We then entered the fine Wady Umm Gilifayn (جليفين), which rises from the seaward base of the Abá 'l-Marú hills and hillocks; and whose mouth has a good Marsá (anchorage-place) for native craft. North of it, and about 2 miles inland, rises the Tuwayyil el-Kibrít, the third or southern sulphur-hill before alluded to.\* The Secondary formations and the conglomerates of the adjoining cliffs and hills take all shades of colour, marvellous to behold when the mirage raises to giant heights the coast-banks patched with pink, red, mauve, and dark brown. Here, too, are the quarries of mottled alabaster which yielded material for the "Palace." Among the many thorn-trees of the wady we saw several small troops of gazelles.

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\* Part III. sect. ii.



After riding 2 hours 40 minutes (=8 miles), we entered a safe gorge, draining a dull-looking unpromising block, the hills of Abá 'l-Marú. We at once found *in situ* chalcedony-agate which strews the seaboard flat. The veins, varying in thickness from an inch to several feet, and mostly striking east-west, overlie the grey granite and underlie the superficial strata of schistose gneiss. The latter, comprising the greater part of these hills, is striped and banded yellow and dark brown; and, in places, it looks exactly like rotten wood. A small specimen of chalcedony in my private collection was examined at Trieste, and contained dendritic gold, visible to the naked eye. Unfortunately M. Marie, the engineer, had neglected this most important rock; and only a few ounces of it, instead of as many tons, were brought back for assay.

A short and easy ascent led to a little counterslope, the Magráh Mujayrah (مقرح مقيرة), whose whitening sides announced quartz. We rode down towards a granitic island where the bed mouths into the broad Wady Mismáh (مسماه),

a feeder of the Wady 'Argah (عرجة). Here after 3 hours 10 minutes (=10 miles) from the well, Nágí, the guide, who thus far had been very misty in the matter of direction, suddenly halted, and pointing to the left bank of the "Magrah," exclaimed in his showman style, "Behold Abá 'l-Marú!" (the "Father of Quartz"). It was another surprise and our last, this snowy reef with jagged crest, at least 500 yards long, forming the finest display of an exposed *filon* we had yet seen; but the first glance told us that it had been worked.

The caravan did not come in till very late; the guides having taken the wrong pass down the Wady Mismáh. My first step was to connect our site with the Umm el-Kárayát; and at 11.55 A.M. Lieuts. Amir and Yusuf were despatched on dromedaries under charge of 'Abdullah the mulatto. They rode down the Wady Mismáh for a few yards, to the mouths of the Wady [Musaymit \* Khuwayshah (مسيمة خويشة) and the

Wady Musaymit el-'Abd, till they entered the Wady el-'Argah running nearly north (330° mag.). On its left bank they found a large vein of quartz; and in a total of 1 hour 30 minutes (=6 miles) they reached the ruins of the Marú el-Khaur el-Kibli, also on the left side. This dependency of Umm el-Karáyát bears nearly due south (340° mag.) from the

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\* Others pronounce the word "Musaymíyyat."

pit and walls visited by Lieut. Amir on March 30th; the interval between the two being about 4 miles. Lying to the N.N.W. of our camp, the *atelier* showed two larger heaps of quartz to the north and to the south-east of the irregular triangle of ruins, whose blunted apex faced north. To the south-east an irregular Fahr (فجر), or pit, in the Marú, leads to a number of little tunnels and galleries.

When the violent dusty wester, a sea-breeze which had nearly blown down our big tent, and which made the vegetation look dead as chaff and timber, had somewhat subsided, we sallied forth to study the quartz-reef. It is the normal vein, in grey granite, running south-north, and falling, in the latter direction, to the valley-plain. Here is a small white outlier, where the quarrymen were ordered to spring a couple of "lagham" (mines); but the snowy stone looks barren. Proceeding northwards the vein disappears below the surface, rising in *filets* upon the farther side of the W. Mismáh. The dip is to the east, where a huge strew of ore-mass and rubbish covers the slope that serves as base to the perpendicular reef. The *Negro-quartz*, which must have formed half the thickness, had been carried bodily away: if anything has been left for posterity it lies below ground. Not the least curious part of this outcrop is the black thread of iron silicate which, broken in places, subtends it to the east. Some specimens have geodes yielding brown powder, and venous cavities lined with botryoidal quartz of amethystine tinge. In other parts of the hills we found, running along the quartz, double as well as single lines of this material, which looked uncommonly like clay.

Continuing our walk up the "Magrah," we hit upon a variety of quartz-veins, showing the same strike as the monster below. Returning to camp we ascended the Wady Mismáh to the east, and inspected the ruins of a large settlement, which extended right across the big Fiumara, and up a minor feature on the southern or left bank. As the guides seemed to ignore its existence, I took the liberty of naming it "Kharábat Abá 'l-Marú"; and next morning the two Lieutenants were left to survey it. Some of the ruins are on a large scale; and one square measured 20 yards. Here the sole peculiarity was the careful mining of a granitic hill on the southern bank. The whole vein of *negro* and white quartz had been cut out on the northern, southern, and western flanks, suggesting the idea of catacombs; farther west another excavation of the same kind of rock was probably the town-quarry. Again, down the watercourse a clump of smaller remains is reported on the left bank.

Here I would place the *Móχoupa* (Móchoura), which Ptolemy locates in N. lat. 24° 30' instead of about N. lat. 26°; and here, assuredly, is the famous mine called by the mediæval Arab geographers, El-Marwah or Zú 'l-Marwah. From El-Mukaddasi\* (vol. i. p. 101) we learn "between Yambú' and El-Marwah are mines of gold." He adds in his Itinerary (I. 107) the following route-directions. "And thou takest from El-Badr† to El-Yambú' 2 stages; thence to the Ras el'-Ayn (?) ‡ 1 stage: again to the Ma'dan (the Mine, i.e. of Gold) 1 stage: and lastly to El-Marwah 2 stages. And thou takest from El-Badr to El-Jár § 1 stage, thence to El-Jahfah (جحفه?) or to El-Yambú' 2 stages each. And thou takest from El-Jiddah (Jeddah) to El-Jár or to El-Surrayn (?) 4 stages each. And thou takest from El-Yasrib (Jatrippa, now El-Medinah) to El-Suwaydíyyah (?) or to Batn el-Nakhil (?) 2 stages each; and from El-Suwaydíyyah to El-Marwah are equal distance (i.e. 4 marches); and from the Batn el-Nakhil to the mine of silver, a similar distance. And if thou seek the Jáddat Misr,|| then take from El-Marwah to El-Sukyá ¶ (سقى?); and thence to Badá Ya'kúb 3 marches;\*\* and thence to El-'Aúnid (عوند) †† 1 march." Hence Sprenger would place Zu 'l-Marwah "four days from El-Hijr on the western road to Medina;" alluding to the western line from Syria, now disused. It ran between the Wady el-Kurá (قرى), that is, El-Hijr, alias Madáin Sálíh and El-Medinah. The modern line of El-Hijr runs farther east, about 15 miles from Khaybar.

We have now seen, lying within short distances, three several quartz-fields known as: 1. *Marwah*, i.e. the single bit or hill of "Marú" (quartz). 2. *Marwát* (in the plural), the places of "Marú," and 3. *Abá 'l-Marú* the "Father of Marú"; not to

\* The passage was copied for me by my learned friend the Aulic Councillor, Ritter Alfred von Kremer.

† El-Badr, meaning the "full moon," is a common name of Arab settlements. That in the text lies on the western or maritime road between Meccah and El-Medinah; it is celebrated for the Apostolic battle which took place there in A.H. 2.

‡ The names marked with interrogations are unknown to the Arabs whom I consulted: they are probably obsolete.

§ Identified by Niebuhr and Wellsted with certain ruins south of Yambú'. See 'The Land of Midian (Revisited),' chap. iv.

|| Meaning the straight path, the highway to Egypt or Cairo, *viâ* Suez and the old railway line.

¶ Elsewhere called Sukyat-Yezid, a name now forgotten.

\*\* As has been said, the Patriarch has fallen into oblivion. See part III. sect. iv.

†† See part III. sect. i.

speak of a *Nakk Abú Marwah* further north, or of a multitude of outcrops locally termed "Jebel el-Marú": "Jebel el-Abyaz," and so forth. The conclusion forced itself upon me that the celebrated Arab gold mine, El-Marwah or Zu l-Marwah, applied to a whole district in South Midian; and then came to denote the chief place and centre of work. To judge from the extent of the ruins and the signs of labour, this focus was at Umm el-Karáyát, the "Mother of the Villages," which, as has been shown, is surrounded by a multitude of miner-towns and *ateliers*. And the produce of the "diggings" would naturally gravitate to El-Badá, the great commercial station upon the Nabathæan "overland" and highway.

Thus El-Marwah would signify the "Hill of Marú" or "Quartz-land"; even as Ophir means "Red-land." A reviewer of my first book on Midian objects to the latter derivation, "as Seetzen, among others, has conclusively shown that Ophir, the true translation of which is 'Riches,' is to be looked for in Southern Arabia." I question the "true translation"; and, whilst owning that one of the many Ophirs, or Red-lands, lay in the modern Yemen, somewhere between Sheba (Sabá) and Havilah (Khaulán), I see no reason for concluding that this was the only Ophir. Had it been a single large emporium on the Red Sea, which collected the produce of Arabia and the exports of India and of West Africa, the traditional site could hardly have escaped the notice of the enquiring Arabian geographers. The ruins of the port would have remained, and we should not be compelled theoretically to postulate its existence.

VII. *Return to El-Wijh.*—We had done our work, "and now the hills stretch home." Nothing remained but to escape as quickly as possible from the ugly Wady Mismáh, with its violent dusty gale, and its blinding glare, reflected and reverberated by the snowy quartz. The last of our marches was on:—

*April 10.*—The camelmen, reckless of orders, began to load and slip away shortly after midnight; even the bugler sounded the *réveillé* of his own accord. MM. Lacaze and Philipin were sent by the round road, *viâ* the inland fort, which added 1 hour 30 minutes to their labour; a guide was directed to accompany them, but all shirked the task. Even the mules, now become terribly intelligent, seemed to guess that they were going homewards. In fact it was a general *saute qui peut*. The caravan had been marching only 13 days, and yet it was like a herd of asses returning to the stall and stable. Setting out at 4.45 A.M., we took the medial line between the inland route and the Secondaries and the conglomerates of the coast, where Lieut. Yusuf had surveyed the route. Descending the Wadys Mismáh

and Musaymit, after 1 hour 15 minutes (= 5 miles), we crossed the head of the Wady el-'Argah. Lower down this bed, and on the north-east side of a hill facing the valley, the detachment under M. Marie had come upon a rock scrawled over with the normal religious formulæ in a comparatively modern Arabic character. The inscriptions lie at some distance to the left of the shore-road and to the right of the pilgrim-highway, thus showing that miners, not passing travellers, have here left their mark. I did not think them worth a visit.

We now traversed the mid-valleys, whose upper courses had become familiar to us: here the exceedingly broad beds were divided by the usual long lines and waves of Nature-metalled ground. The line was one mass of quartz in veins and scatters proceeding from the hills to the right and left. The principal heights are the Jebels El-Misayk (مسيك), "of hard waterless ground;" El-Fishaykh (فشيخ); El-Kharáwah (خراوة); and

El-Hashímah further east. In fact the whole world was white as we had seen it at the "Divide of the Ram;" and it surprised not a little those who, having travelled along the coast, never suspected the existence of quartz. Presently on our left rose the Hamírat Habbán,\* a Mismár ("nail"), as the Arabs call these detached knobs. According to Lieut. Yusuf's plan it gives birth to the Wadys Habbán, Habíbayn, Abú Markhah, Abú Marákhah and Abú Yábit. To the north-east of this red *butte* are the Jebel and Wady El-Kurr, the latter an old acquaintance. Then come successively the Wady Habíbayn (حبيبين), which anastomoses with the Wady Abú Markhah (مرخة); the small Abú Yábit (يابت); and another familiar form, the huge Wady El-Miyáh, which has a brackish well near the sea.

Presently appeared on the left the second of the Hamírahs, a granite mass somewhat resembling those which we had noticed in the Wady El-Wijh; it is distinguished as the "Hamírat el-Nabwah" (نبوة); we then suddenly began to tread upon the Secondary formation of the shore-line. After quitting the Wady el-Makhayt (مخيط), and leaving eastward the third "Hamírah," El-Surrah (صرة), we entered the great Wady Surrah.

\* Wellsted (ii. 194) speaks of the "Sharm 'Abbán (for Habbán) as a good and land-locked anchorage for three or four vessels, lying east of Mardúnah Island.

This feature is described by the Arabs as draining the Hamíratayn, or "Two Reds" (Nos. 2 and 3). Its proper and direct mouth would be the Wady El-Gá'h (قاع = Ká'h, *i.e.* the hall); but it winds northwards and forms the Melláhah, or Salina.

Our last stage ended happily. At 10.15 A.M., after riding 5 hours 30 minutes (= 17 miles), we found ourselves once more upon the seaboard. Our kind host, Captain Hasan Bey, commanding the *Sinnár*, came out to meet us in his gig. The quarter-deck was dressed with flags as for a ball; and, before twelve bells had struck, we had applied ourselves to an excellent breakfast in the gunroom of our old lodgings.

We had left the Sharm Yáharr on March 21, and returned to it on April 13, a total of 34 days. The actual march through South Midian, which had lasted 13 days (March 29–April 10), described a semicircle with El-Wijh about the middle of the chord. The length is represented by 170 miles in round numbers; as usual, this does not include the various offsets and the by-paths explored by the members; nor do the voyages to El-Wijh and El-Haurá, going and coming, figure in the line of route. The number of camels varied from 58 to 64, when specimens were forwarded to the harbour town. The expenditure amounted to 92*l.* 13*s.*, including pay and "backshish" to the Baliyy Shaykhs.

#### CONCLUSION.

I shall hurry over our last proceedings in Arabia, which have no geographical interest. We tarried at El-Wijh long enough to pay our debts and ship the men, mules, and the material collected on the southern march. The venerable 'Afnán and his Baliyy were not difficult to deal with; and they went their way homewards fully contented. We exchanged a friendly adieu, or rather an *au revoir*, with our travelling companion Mohammed Shahádah, ex-Wakil of El-Wijh; and I expressed my sincere hopes to find him, at no distant time, Governor of the restored Quarantine Station.

On the morning of April 12 we set out early, and passed the night in one of the snug bays of Jebel Nu'mán. The next day placed us at Sharm Yáharr, where the process of general distribution happily ended. Shaykh Furayj at once set out to rejoin his tribe up the country; while the Sayyid 'Abd el-Rahím gallantly stayed with us till the end. These men had become friends; and our sorrow at parting with them was softened only by the prospects of presently seeing them again.

The Expedition in its urgent desire to return northwards was not seconded by weather. Despite an ugly gale, the *Sinnár*

boldly attempted giving the slip to Arabia on April 16; but she was beaten back before she reached El-Muwaylah. After another stormy day, we again got up steam, and, fighting hard against adverse winds and waves, we reached Suez on April 20.

The following list of stations between El-'Akabah and El-Haurá, our furthest northern and southern points, is taken from the 'Route of the Pilgrims from Cairo to Meccah,' p. 541 of the *Jihán-numá*, or *Speculum Mundi*. The author was Háji Khalífah, whom Joseph Hammer ('Ancient Alphabets,' &c., London, Nicol, 1806) calls "Chalabizaade Hadshi (Háji) Khalfa, encyclopædist and bibliographer." He is also known as Katib Chelebí. He died A.H. 1068 (= A.D. 1658); Flügel adds in the month of September.<sup>1</sup> The chief interest of his itinerary is that it describes the modern line laid out by Sultan Selim. The older route lay further east and inland; passing *viâ* the Goz el-Hannán, Zebbayib (Wady Surr) Tuwayl el-Súk and the ruins of Shuwák and Shaghab.

"Sat'h el-'Akabah (the plain, or the summit of the ascent), *i.e.* the 'Akabah (ascent) of Ailah (Aylah), where there was anciently a large town, now in ruins. In a low place near it there is a well lined with stone, the water of which is sweet, in a palm-grove. The Arabs settled there are those of Howeítát (Huwaytát).<sup>2</sup>

"The next station completes the first quarter of this route.<sup>3</sup> Its water is sweet and plentiful. It (*i.e.* the road) all passes along the sea-shore. On the left<sup>4</sup> side is Mount Tór, stretching out for a space of several miles in extent. In the latter part of it there are two descents and narrow gorges (bogház), in which are pits with wells of sweet water. Thence there is an ascent to the:—

"Dhahr himár ("Ass's Back"), a rocky acclivity.<sup>5</sup> Thence to:—

"Jurfein ("the two Gullies").<sup>6</sup> Thence to:—

"Sherfehi Bení 'Atiyeh ("the Turret or Watch-tower of the Children of 'Atiyeh"), where there is much wood.<sup>7</sup> Thence to:—

<sup>1</sup> The translation is taken from Lieut. Wellsted (vol. ii., Appendix). The few notes with numerals are my own.

<sup>2</sup> The "plain" alludes to the head of the pass; whereas the ruined town is at the mouth of the valley below. The "low place" is the site of the present settlement. See 'The Land of Midian (Revisited),' chap. vii.

<sup>3</sup> *I.e.*, from Cairo to Meccah.

<sup>4</sup> That is, going from Meccah to Cairo.

<sup>5</sup> So called from a rise in the south. The modern station is El-Hagul (Haki), the Ancale of Ptolemy. See chap. viii. *loc. cit.*

<sup>6</sup> "Rather the "two high nullah-banks;" the place is generally called Umm Jurfayn.

<sup>7</sup> "Sharaf Bení 'Atiyyah," that is the high-place of the tribe now called the

"Matlát ("the salt Slough"), between two mountains. Here is the permanent abode of the Bení Lám.<sup>8</sup> Thence to:—

"Maghárehi Sho'aib (the Cave of Sho'aib, father-in-law of Moses). There is sweet water in its pits, a palm-grove, and many ethl (tamarisk) and mokl (or dúm)<sup>9</sup> trees like those that grow near the river Nile.<sup>10</sup> There are here also inscribed tablets (alwáh = rock-faces) on which the names of ancient kings are engraven. Thence to:—

"Kabr-el-tawáshi ("the Eunuch's Grave").<sup>11</sup> Thence to:—

"'Uyun Kasab ("Reed Springs"). It is a watery, rushy, and excessively hot valley (wádi). In summer-time many persons die there suddenly.<sup>12</sup> The grave of the children of Abraham, near the sea there, is a place of pilgrimage (ziyáreh). Thence to:—

"Sherm ("a Creek") near the sea; on the left of it there is a mountain called Isháreh ("the Mark").<sup>13</sup> Thence to:—

"Mowilahh, on the seashore: there is water, but it is rancid.<sup>14</sup> Thence to:—

"Dár Kait-Bái (Kaït Bai's House), so named from that sultan having stopped there when performing the pilgrimage; before that they used to stop at Batn Kibrit ("Sulphur Belly"),<sup>15</sup> a narrow, stony place. Thence to:—

Beni Ma'ázah. The site is popularly known as El-Sharaf. Caravans halt at El-Rijm, the "Heap of Stones," about 1 hour 30 minutes to the south, and find water. The distance to Magháir Shu'ayb is the normal stage of 12 slow hours.

<sup>8</sup> The name "Matlát" is unknown, and the Beni Lám of Midian survive only in a proverb Katí'at Bení Lám (the "Cutting off of the Beni Lám"), said when a thing is clean gone. The tribe, however, is still great and powerful in Mesopotamia between Baghdád and the Persian Gulf.

<sup>9</sup> Crucifera Thebaica, or bifurcate palm, the Palma Thebaica of the ancients.

<sup>10</sup> Magháir is a plural, "caves" (catacombs). "Mukl" (*i.e.* bdellium-tree) is a word unknown to the modern Midianites, who eat the fruit (Wagul = Wajul) of the Palma or Crucifera Thebaica. This fan-palm, when young and bushy, is called Saur (صور). In the Sudán it is one of the most useful of growths, and supplies

everything from sandals to drinking-cups.

<sup>11</sup> The Eunuch's grave is still seen at the head of the Zibá Cove. See chap. xii. of the 'Land of Midian (Revisited).'

<sup>12</sup> This description of 'Aynúnah is not borne out by the accounts of the Bedawin, who praise both its water and its air. The visitation-place mentioned in the text is wholly forgotten, and the nearest spot held holy by the Arabs is the Goz el-Hannán (the "Moaning Sandheap") east of Sharmá. See chap. ii. *loc. cit.* Either one or both of them may have inherited the honours of the ancient pilgrimage to the "Gods of the Grove" ('The Gold Mines of Midian,' p. 182).

<sup>13</sup> The Wady and its ruins are called Sharmá, an Arabic word showing that the classical name is forgotten. The "Mountain-Isharah" is the modern Sharr. See chap. xiii.

<sup>14</sup> Read "unwholesome," fever-breeding.

<sup>15</sup> The memory of the Circassian Mamlúk Soldan, El-Ashraf Abu'l-Nasr Kaíd Bey el-Záhiri, who, after a successful campaign against the Turks, made peace with them in A.D. 1490-91, is now forgotten. The "Sulphur-belly," which should be rendered "hollow below the sulphur-cone," is our "Sulphur-hill" (Tuwayyil el-Kibrit), at the head of the Jibbah Creek, where the caravan now encamps.



"Kabr Sheikh el-Kefafi. Sheikh el-Kefafi having been killed by a spear, was buried there, and his grave is a place of pilgrimage.<sup>16</sup> Thence to:—

"Azlam (a very smooth Arrow). The second quarter [of the whole distance] a salt, marshy place, without any herbage, and having water which is salt. In the midst of these mountains there is a desert plain (Sahrá). Mecca senna is found here.<sup>17</sup> Thence to:—

"Simák (Sumach), also called Rakhanín;<sup>18</sup> it is a valley (wadi) in which there are many thorns. After passing it is:—

"Istabl 'Antar (Antar's Stable), an open plain among the mountains, where Arák [*Salvadora Persica*] is found, and on the borders of it there is sweet water.<sup>19</sup> Thence to:—

"Sherenbeh (the thick-pawed Lion),<sup>20</sup> a mountain cape. Thence to:—

"Wejh (the Face) a valley (wadi), in which there are wells of sweet water. They were renewed by Ibrahim Páshá, in the year 930 (A.D. 1524), and are supplied by rain and torrents.<sup>21</sup> Thence to:—

"Bir-el-Karawí ("Villagers' Well). Thence to:—

"Haríreh ('milk Porridge'). Thence to:—

"Haurá ('the black-eyed Girl'),<sup>22</sup> where there is water, but it is bitter."

<sup>16</sup> See chap. xii. 'Midian (Revisited).' The tomb still exists between Wady Kifáfah (North) and W. Selmá (South).

<sup>17</sup> From Ziba (Eunuch's Tomb) the first march is to the Wady Azlam, where a ruined fort and two wells of brackish water are found. See chap. xiv.

<sup>18</sup> May be the Wady Dukhán, or Abú Dukhán, which contains ruins. See chap. xiv.

<sup>19</sup> The second camping-place from Zibá. This "wady" drains the little, Jebel 'Antar, a range rising north of the great Jebel Libin (or Libn), and it is supposed to be the site of the ancient Rhaunathos. For the errors of the Admiralty Chart see chap. xiv.

<sup>20</sup> Humayrát el-Shurumbah (the "Red Hills of Shurumbah") is the name of certain waterless hillocks south of El-Wijh, here called Wejh.

<sup>21</sup> See chap. xvi.

<sup>22</sup> I cannot understand why Prof. Palmer ('Desert of the Exodus,' p. 319) says that "El-Haurá" in the Negeb has "some such primary signification" as *City of Cisterns*. The word, which is the feminine of Ahwar, simply means "Pagus Albus," Whity. The Wady el-Ayn, in which the caravan camps, supplies excellent water.

NOTE.—The map which accompanies this paper has been reduced from the original drawing executed by the officers of the Egyptian General Staff engaged in the Survey of the country; but it will be noticed that it differs very materially in several places from Captain Burton's narrative, besides being deficient in marking many prominent features which he describes.—W. J. T.

## II.—*A Visit to Lissa and Pelagosa.* By R. F. BURTON.

### PART I.—*Lissa.*

LISSA of the classical, Lissa of our modern day, to the historian, perhaps, the most important, while physically one of the smallest, and the westernmost, that is the furthest from land, of all the main features forming the Dalmatian Archipelago, had again and again tantalised me with a distant view. From south as well as from north I had sighted the tall "Monte Hum" projecting two tongues eastward and westward; the former long, the latter short, and both outlined in regular series of gentle convexes and concaves, domes and breaks, with the last and lowest sinking below the blue Dalmatian Sea.

Three years, however, passed before September 1876 afforded me the opportunity of inspecting the new Vice-Consulate, and the graveyard of our gallant countrymen who fell in the naval action of 1811. My excellent friend M. Alber, Ritter von Glanstätten, President of the Maritime Government at Trieste, an official whose name will ever be remembered on the Istrian and Dalmatian shores, was sending the I. R. S. S. *La Pelagosa* (Captains Lúsina and Zudenigo) with a "Col-laudo" or commission to audit the accounts of a new lighthouse; and, as visits to isolated rocks have their difficulties in these seas, I felt grateful for his permission to form one of the party. It consisted of the Councillor Klose; Cav. Pietro Accerboni, I. R. Inspector of Lighthouses on the Austrian Littoral, and Herr Oberingenieur Richard Hänisch, the Government Engineer of the works; with the contractors M. Antonio Topich and his eldest son M. Serafino. The "Scientific Commission" was composed of Dr. Carlo de Marchesetti, Custos of the Civic Museum, Trieste; and Sig. Michele Stossich, a student of Natural History, son of the respected Professor of Botany at the Scuole Reali in the capital of the "Coast-land."

On Sept. 22, shortly after midday, when every item of nature looked its best and brightest, from the clear green of the shallow waters to the deep blue of the sky, we ran past the two sun-bleached rock-lumps, known as the "Manzetti" (bull-calves), and presently found ourselves in the magnificent Porto di San Giorgio di Lissa, where an Englishman still feels at home, and where English feeling is warmer than in many of our colonies. The harbour is one of the best in the region of admirable "Zuffuchthafens," landlocked and free from rocks and shoals; easy of access, and extending about one mile deep by half that average breadth.

On the seaward brow of the north-western ridge that bounds the bay, rises Fort Benting\* (Bentinck), an artless round tower, lately repaired and resembling its neighbour, Fort Robertson; both remind us of the engineer's maxim, "small work, bad work." The latter leads down to the larger square defence, called by the people Forte di S. Giorgio, and by us Fort York; it now serves as a Castello d'acqua (water reservoir); and it can cross fire with Fort Smith upon the other side of the harbour-mouth. The *Porto veramente teatrale* (Fortis) is defended to the N.N.W. by a natural breakwater, the Scoglio "Oste" or "Osti," in which we recognise (Commodore Sir William) "Hoste Island;"† the bare and glaring bit of limestone has changed its two old batteries and its ruined barracks for a trim, new green-capped lighthouse.‡ Complete defence against the sea is secured by a rocky prong projecting from the eastern jaw of the harbour. Here Fort Schmidt (Smith), backed by Fort Wellington on the ridge-top, the most elevated of the three martello-towers built by the English, crosses fire with Fort York, and with two more modern batteries, the Seppurinas (Zuparinas), upper and lower; the former generally known as La Manula, after a former Governor-General of the Dalmatian Kingdom. Lissa, condemned by the Reichs Befestigungs Commission of 1870, was formerly defended by about a hundred guns; all were removed in 1873, and the works are made over to a few care-takers.

It is almost incredible that this western "Cavalier" of the bastion of Central Dalmatia between the Rivers Kerka and Narenta; this natural fortress, distant only 150 direct geographical miles from Pola, and 130 from Cattaro, commanding the western terminus of the Mostar-Serajewo-Nisch-Adrianople-Stambul Line, the inner navigation-canals of the kingdom; and, indeed, the middle section of the Adriatic Gulf should thus be abandoned. Despite the example of the English, who, in 1810, thoroughly appreciated its value, the opinion of Tegetthoff has prevailed. The "Austrian Nelson" held that the isolated work must fall unless protected by a fleet, and, therefore, that the latter deserved all his care. Under present circumstances the peril of inviting hostile occupation is recognised, and Austria proposes to convert Lissa into a fortress of the second rank, with a circular tramway; platforms for guns

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\* I quote from the latest Austrian hydrographic map, 'Küstenland, Lissa, No. 19,' the admirable work of my friend the Fregatten Kapitän, T. Oesterreicher, *Aufnahme-Director im Jahr. 1869.*

† There is another "Hoste Island" near the Tierra del Fuego.

‡ Not to be confounded with the outer lighthouse, which we shall pass on our way to Pelagosa Island.

and mortars at the crucial points, and a cistern at each front. The whole would be supported by a coast-guard of 7 or 8 monitors stationed in Port S. Giorgio; and in these days torpedos will not be forgotten.\*

As we steam onwards we leave to starboard the "Porto Inglese," covered by its own batteries, and marked by a small white-washed coal depot. The south-west end of the port known as the "Stanza" (*Statio*, i. e. *navalis*) forms a "Mandracchio," dock or inner harbour, protected by a spit jutting from the western jaw, the Point of S. Girolamo. And here we anchor off Lissa, the city whose age has not yet reached the fourth century. It is a long narrow line occupying a ledge faced by the still waters, and backed by hills rising some 300 to 700 feet; the latter are here fawn-grey with stone-heaps collected to clear the ground; there dark with the scrub of myrtle, juniper and terebinth; and everywhere dotted with patches of the carob (*Ceratonia siliqua*), whose deep metallic green is lit up at this season by points of burning red.† The place, like all the picturesque island-settlements of its date, wears a distinctly Venetian aspect; we see the ex-Queen of the Sea in its many-gabled houses of stone and lime, capped with rusty tiled roofs; its small barred windows and its huge balconies supported by proportionate corbels: a few of the façades are tinted red, but the blues and yellows of the Dalmatian mainland appear not to be in vogue.

Lissa city falls distinctly into three parts. The easternmost is the Kut, angle or corner,‡ which some derive from an English name—Coutts. It contains the Palazzo of the old Venetian Counts Gariboldi, and the lodgings of the English governor are still shown: here too is the solid steeple of S. Cipriano, which, from a fisherman's chapel built in the thirteenth or fourteenth century, became the point of attraction for the new settlement. The Čunkovica gorge, descending from the Altipiano, or plateau of the island, and crossed by a solid single-arched causeway (Pút od Čunkovica), separates the Kut suburb from the main body, which bears the name of *Lùka*, or the Bay. The latter begins with the Batteria Madonna, so called from the parochial church whose skeleton belfry suggests peril

\* Two excellent papers by Colonel M——, on the 'Strategische Bedeutung von Lissa,' appeared in the 'Feuilleton of the Triester Zeitung,' December 5-6, 1876.

† The Algarroba, or Johannisbrod, as the German theorist boldly calls it, is about to be planted in India, where, if it flourish as in Syria, it will be a valuable acquisition.

‡ Compare the Sansk. कृ, to make crooked.

of earthquakes: this open work, together with the Wellington Martello,\* did considerable damage to the Italian ironclads, *Formidable*, *San Martino* and *Castelfidardo*, armed with 300-pounders, and compelled them to retire. The Madonna is now fronted by a shady Marine Promenade; the normal yellow Sanità (health-office), bearing the brilliant Austro-Hungarian flag, faces the dwarf Mole; and the neat Marina or quay of cut stone is broken with landing-steps, and garnished with cannon to make fast hawsers; the guns of Dubourdieu's ship *La Favorite* having thus been utilised. This broad and open esplanade, the glory of Dalmatian towns, forms a curious contrast with the single longitudinal alley-street and the cross lanes which certainly were not built to accommodate the coach and four. The Luka ends at its Castello, a sturdy three-storied square tower with two angle-turrets or sentry-boxes projecting from the battlemented parapet: once useful to keep Saracen and Turkish pirates at bay, it is separated by a wide, clear space from the Mala Banda (Banda Piccola). This west-end occupies the bottom of the bay: its main features are the Chapel of Santo Spirito, the old Government House now occupied by its owner; the foreground of boats in the caulkers' hands, and the background of tenements creeping up the Bandarica hill. Beyond the western suburb begins the antiquarian interest of the bay; the Gradina, or old town (Issa), which we shall presently inspect. The island of Lissa, the Vis of the Slavs,† is so rarely mentioned in later works of English travel that, before proceeding to its antiquities, I ask leave for a few lines upon its topography and its annals. It is the westernmost of the great group which, disposed almost upon a parallel, ends the Dalmatian Archipelago to the south; the latitude of the apex is N. 43° 1' 43"; its long. E. (Gr.) 16° 6' 54"; it lies 12 direct geographical miles to the south-west of Lesina, city and island; 36 from the Dalmatian continent, and 65 from Monte Gargauo. The length from east to west is 9 miles; the maximum breadth 4, and the circumference about 23. The distribution is into the "Gemeinde" (Communes) Lissa or Vis, and Comisa or Komiza, whose headquarters are united by a good road, easily covered in 2 hours. The former contains 3540 souls, of whom 3013 occupy the town;‡ and the whole island is rated at 8000: there is a single

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\* Armed with three 60-pounders and one 30-pounder mortar.

† Vis would mean a height or a mountain-top: it is another instance of the curious facility with which the Slavs corrupt classical terms, retaining the general form of the original and adding a meaning of their own.

‡ The people, always apt to exaggerate in these matters, prefer 4500 for the capital. I borrow my figures from the 'Allerhöchste Kaiserreise' &c., Vienna, 1875, by my learned friend, Dr. (Professor) Franz Coglievina of Cherso.

Volkschule (Scuola Provinciale) and a Kuratstation (Curate-Station) at Lissa city.

The shape of the island is a long parallelogram with two breaks, the Porto di S. Giorgio on the eastern short side, and the Vallone di Comisa, contained between two long prongs stretching due west and south-west (mag.) The outer walls are stony ridges rising from 470 to 610 feet above sea-level and declining quaquaversally to the fertile plateau which, averaging 400 feet high, forms the body of the island; the valleys are rich, but the uplands in general want water. The necessary is poorly supplied by a cistern; the single spring near Comisa is reported to be brackish. The apex is "Monte Hum,"\* a bald and flattened cone, numbering 1868 (Austrian) feet, on the south-west of the island.

The history of Lissa has hardly been treated as it deserves. About the middle of the last century a literato belonging to the now extinct house of Caramaneo (*Slavice* Karamanovich) made extensive studies. He fell into bad odour for proving, in a learned dissertation, that the relics of Saint Domnius at Spalato have no just title to honour; and his manuscripts are now, I am told, scattered amongst the descendants of his fellow-citizens. In 1772 the Abate Fortis† seems to have found the weather too hot for studying the *Vestigj miserabili*, whilst he notices at Zara (I. i. § 5, p. 17) three Greek tables from the island, apparently part of a Pésphisma, with fragments of the senators' subscriptions. Notes have also been published by Major Catalinich, of Zara, in his 'Storia della Dalmazia,' and by Professor Weber; but I was unable to find their works. The readiest source of information is the 'Manuale del Regno di Dalmazia,' annually published, since 1871, by Signor Luigi Maschek,‡ Councillor to the Luogotenenza of Zara. He borrows largely from the 'Prospetto Chronologico della Storia della Dalmazia,' and from vol. i. of the 'Memoria sulla Dalmazia,' by the Avv. V. Lugo. His historical and statistical details concerning the coast and the archipelago will be valued and acknowledged when the increased visits of strangers from the North shall call for a 'Handbook of Dalmatia.' Finally, I am

\* "Monte Hum" and our "Mount Hum" are pleonasms. "Hum," literally a hillock, and understood as *Sommità*, is almost a generic name with the Illyrian Slavs, as Monte Maggiore with the Italians. Thus, there is a "Hum" in Savioncello, Lesina, Lágosta, Brazza, Montenegro, and other adjoining places. The vulgar sometimes pronounce the word like "Ghum," with the Arabic "Ghayn."

† I have noticed his meritorious labours (*Viaggio in Dalmazia*) in my paper on the 'Long Wall of Salona,' &c., *Anthrop. Inst.* 1875. He was translated into English and printed by J. Robson, MDCCLXXVII., in a folio of 534 pages; with the map and illustrations of the original, and, like it, without an index. The pages in the text refer to the Venetian folio of MDCCLXXIV.

‡ In my paper on 'Salona' (p. 276), the name was misprinted *Maschek*.

assured that the Abate D. Apollonio Zanella, of Bergamascan family, now of Lissa, a good Latin and Greek scholar, and a diligent student, whose fortune allows him to exchange parochial for literary labour, is preparing an exhaustive history of the classical island.

The glorious harbour of refuge, the amenity of the climate, and the fertility of the soil, must have attracted immigrants to Lissa before the dawn of history. Signor Lugo shows that a colony of Pelasgi, or Archaic Greeks, from Ægean Issa, or Isse \* (Lesbos), first occupied and named the island in memory of their old homes. Presently uniting with the Liburnians, the most powerful tribe of the northern mainland,† and associating with the Etruscans of Adria, they called that part of the Adriatic the Liburnian Sea. Its autonomy was subverted by the Tyrants of Syracuse. About B.C. 402 Dionysius the Elder occupied it by a colony, and gave it a place in authentic history. Between B.C. 384 and 380 these newcomers threw off the yoke of the old country; and, aided by the Issæi, defeated the Illyrians, especially the Ardiæi, whom Strabo § (vii. 5) calls Vardæi, and Ptolemy (ii. 16, § 8) *Οἰαρδαῖοι*; and shortly afterwards they founded Epetium (*hod.* Stobrez), Tragurium (Traù), and Lissus (Alessio), on the mainland. During the First Punic War Duillius gained his naval victory with the assistance of the Liburnians and of the "Lembi Issaici," manned by a brave and hardy race of seamen, by no means extinct. In B.C. 240 Agron, son of Pleuratus, king of the Illyrians, and his allies the Liburnians, successfully opposed the Issæi of Tragurium and Epetium, who attempted to annex the broad lands bounded by the Titius River (*hod.* Kerka) to the north, and by the Tilurus (Cettina, or River of Almissa) to the south. He was, however, unable to subjugate the island which the Romans, after conquering Sicily, in token of gratitude, had taken under their protection (B.C. 242).

In B.C. 229 Issa was blockaded by the fleet of Teuta, widow of Agron, who governed in the name of her stepson, Pinnes, a minor; and, ten years afterwards, it was occupied by Deme-

\* Strabo, i. 3. Lesbos afterwards took the name of Mitylene from its chief city, and retains the word in a corrupted form. The oldest name thus appears in Lycophron (Cassandra, 219-20):—

Ὦς μὴ σε Κάδμος ὤφελ' ἐν περιφύτῳ  
Ἰσση φυτεύσαι δυσμεῖων ποδηγέτην.

Thus rendered by Jos. Scaliger:—

Atque utinam in Issa te (Prylin) Camillus insula  
Non procreasset, hostium nostrum ducem.

See vol. iii. p. 1129. Müller, Lipsiæ, MDCCCXI.

† Liburnia began at the *Arsiæ flumen* (*hod.* Arsa) of Istria, and ended with the River Titius, now the Kerka of Sebenico.

trius, Tyrant of Pharos, acting in the name of the Illyrian queen.\* When the latter, beaten by the Great Republic, became a suitor for peace (B.C. 219), the Issæi were freed from paying tribute to her. They again assisted Rome in her struggle with Philip of Macedon, son of Demetrius (B.C. 200–197); and, as her friends and allies they retained their autonomy, despite the efforts of Gentius, the last king of Illyris,† who, in B.C. 167, after a month's war, surrendered himself to the all-absorbing Republic. Issa, the city, was an important place in the days of Cæsar, and at that time, as now, the island had two principal settlements; one bearing its name, and the other called “Meo,” which is probably represented by the modern Comisa. Finally, in A.D. 42, M. Furius Camillus Scribonianus, proclaimed Emperor by the Dalmatians in opposition to Claudius, but disowned by the legionaries whom he commanded, took refuge in Issa, where he was killed by the soldier Volaginius, in the arms of Claudia his wife.‡ For many a generation after that event Issa almost disappears from history.

This active alliance with the Romans, and perhaps her excellent growths of wine, recommended Issa to the notice of the classical poets and geographers. Scylax Caryandensis (fifth century B.C.) mentions Ἴσσαι νῆσος καὶ πόλεις Ἑλληνίδες αὐται after Φάρος (cap. xxiii.). Apollonius Rhodius (Ἀργοναυτικῶν Δ, 563–5) writes:—

τὰς δ' ἀπέλειπον ὅσαι Κόλχοισι πάροιθεν  
Ἐξείης πλήθοντο Λιβυρινίδες εἰν ἅλιν νῆσοι  
Ἴσά τε Δυσκέλαδός τε καὶ ἱμερτὴ Πιτύνεια.

\* The four principal epochs of Issan and Lissan history, are—

- 1st. The blockade by Queen Teuta (B.C. 229).
- 2nd. The occupation by Demetrius of Pharos (B.C. 219).
- 3rd. The occupation by England after the expulsion of the French (A.D. 1812–15).
- 4th. The attack of the Italian fleet, which ended in the naval victory of Austria (July 20, 1866).

† The historian Mr. E. A. Freeman, has adopted the general opinion that the Illyrians are represented by the people of Albania, “one of those ill-fated portions of earth,” says Arnold, “which, though placed in immediate contact with civilisation, has remained perpetually barbarian.”

‡ It is said that his sepulchre was found in 1710; but I failed to procure any information about it.

§ In my paper on ‘Salona’ (p. 280), I have mentioned the usual interpretation of Δυσκέλαδος. But may not the epithet “harsh-sounding” better apply to the neighbouring Island of Pelagosa, whose roaring and spouting caverns resemble those of Μελέτη (*hod.* Meleda)? The latter have been the subject of a modern volume, ‘Bericht über das Detonations Phänomen auf der Insel Meleda,’ &c., von Paul Partsch, Wien, Heubner, 1826. In pp. 101–102 the learned author quotes fifteen publications upon the subject: he approves of Herr Littrow, and he is severe upon Herr Sterlin. Finally, he adopts the “Einsturz-Hypotesie,” rocks falling in the hollow bowels of the earth, as the general cause of the mysterious sounds.



Scymnus Chius (first century B.C.), in his *Περιήγησις* (413-14), makes it the hegemon of the Illyrian Archipelago:—

Νῆσος κατ' αὐτοὺς δ' ἔστιν Ἴσση λεγομένη  
Συρακοσίων ἔχουσα τὴν ἀποικίαν.

Strabo (ii. 5 and vii. 7) places it correctly, and mentions its colony, Tragurium. Not so Pomponius Mela (ii. 7, *Mediterranei Maris Insulæ*), who, nearly a century after the geographer of Pontus, throws the Archipelago into complete and inextricable confusion.\* Pliny (*Nat. Hist.* iii. 26, &c.) correctly places Issa opposite the mouth of the Iader, or River of Salona, and mentions the Issæi and the Epetines, "nations inhabiting the islands, the former having the rights of Roman citizens." In Ptolemy (ii. 16, § 14) we have the following table of longitudes and latitudes:—

Τῇ δὲ Δαλματία νῆσοι παράκειν τὰι

Ἴσση καὶ πόλις . . .	Long. $\mu\beta \gamma$ ( $42^{\circ} 20'$ ) . . .	Lat. $\mu\gamma$ ( $43^{\circ} 15'$ ).
Τραγοῦριον κ. π. . .	" $\mu\gamma$ ( $43^{\circ}$ ) . . .	" $\mu\beta \alpha' \delta'$ ( $42^{\circ} 45'$ ).
Φαρία κ. π. . . . .	" $\mu\gamma$ ( $43^{\circ}$ ) . . .	" $\mu\beta \gamma'$ ( $42^{\circ} 50'$ ).
Κόρκουρα ἢ μέλαινα . .	" $\mu\delta$ ( $44^{\circ}$ ) . . .	" $\mu\alpha \alpha' \delta'$ ( $41^{\circ} 45'$ ).
Μελιτινὴ νῆσος . . .	" $\mu\delta \sigma'$ ( $44^{\circ} 10'$ ) . . .	" $\mu\alpha \gamma'$ ( $41^{\circ} 20'$ ).

Here his latitudes are tolerably correct; whilst he places Trieste (*Tergestum Colonia*) in N. lat.  $44^{\circ} 55'$ , or nearly one degree too far south. Issa holds high rank in *Agathemerus* (*Ἀγαθημέρου τῆς Γεωγραφίας ὑποτυπώσεις ἐν ἐπιτομῇ*. Hudson's *Geog. Script. Gr. Minores*), who during our third century made in two books extracts from Ptolemy and earlier writers. His words are *Εἰς δὲ καὶ ἐν τῷ Ἀδρία νῆσοι παρὰ τὴν Ἰλλυρίδα, ὧν ἐπισημότερος Ἴσση, καὶ ἡ Μέλαιμα Κόρκουρα, καὶ Φάρος, καὶ Μελίτη, ὧν ἀγνοῶ τὰς περιμέτρους* BIBL. A'. πεφ. ε', p. 156, *Συλλογῆς*, &c., by the Brothers Zozimas, Vienna, AΩZ.

Issa, I have said, † almost disappears from history after the death of Scribonianus. She was alternately Roman, Byzantine, and autonomous. As Salona and the lowland cities of Dalmatia, the extensive commerce and navigation of the Archipelago must have suffered severely from the invasions of barbarous

\* His order, or rather disorder, is Apsoros (Ossero, Cherso, Lussin Island), *Dyscolados* (Lissa? Pelagosa? Brazza?); Absyrtis (Unie? Pago? compare Strabo ii. 5), Issa; Pityia (Pityusa or Porto Tolon, Santo Andrea?); Hydria (?), the *Electrides* (cf. Pliny. iii. 30; while Strabo, v. 1, denies their existence off the mouth of the Po); Nigra Corcyra (Cuzzola); Tragurium (Traù); Diomedea (the Tremiti); Cestria (?); Sason (Saseno, Sasino, Sasono or Sasso off the coast of Albania); and, finally, returning from south to north, Pharos (Lesina), which is described as "adjoining Brundisium even as another (of the same name) lies near Alexandria."

† These notes on the history of Lissa in the dark ages are taken bodily from M. Maschek (*loc. cit.*).

hordes, the Ostrogoths (A.D. 393), and the Visigoths (A.D. 395); and, perhaps, not less from the rage of monachism introduced by the example of Saint Jerome (ob. A.D. 420) the Dalmatian. About A.D. 449, the Bosniac Slavs, driven by the Huns westward from the Danube, occupied the island; hence the Slav innervation of the present race. They were followed by another "Tempest of the Tribes," as Jornandes calls it; incursions of the Vandals, the Sarmatæ (A.D. 457), the Suevi, the Heruli, the Avars (A.D. 610), and the Croato-Serbs in A.D. 640. About the middle of the seventh century, the island, now Slavic, belonged to the empire of the East, as the Teutons to that of the West; and the cession of Dalmatia, by Carolus Magnus, to Byzantium in A.D. 808 confirmed its position.

But darker days were in store for it, and nothing can be more dreary or monotonous than its history: indeed the same may be said of mediæval Dalmatia in general. Between A.D. 837-864, the Narentan pirates became the pest of the Adriatic: they made themselves the *Maximi Venetorum emuli*; they did much harm to *tot populis Sclavoniæ nostræ*, and they retained possession of the islands for a century. In A.D. 867 came the Saracens, then apparently in league with their fellow thieves.

In the tenth century Venice determined to crush her piratical enemies, and her Admiral, Bragadin, recovered Lissa from the Narentans (A.D. 996). Probably at this time, its darkest hour, the classical city became a ruin, and the inhabitants exchanged the coast for the interior, where they occupied detached villages. In A.D. 1075, the Doge Domenico Silvio utterly destroyed the Normanno-Narentan fleet, with all their works and establishments upon our island. About the same time Zvonimir-Demetrius, King of Croatia, permitted Lissa, like Brazza and Lesina, freely to trade with his dominions. Venice, all powerful in A.D. 1143, allowed in A.D. 1184 her rival Ragusa to supplant her in the protectorate of the island, and, in A.D. 1242, the Commune of Lesina began to exercise a jurisdiction which lasted till late years. In 1278 (April 1), Lissa and Lesina, suffering from the pirates of Almissa, applied once more to Venice, who incontinently occupied the two: each was ruled by its own Provveditore, subject to the Provveditore Generale of Zara.

The descendants of the old Issæi, driven from the dangerous coast to the interior, held in the fifteenth century their capital at Velo-Selo,\* the Great Village, in contradistinction to the

\* In Russia we find the same word, as in Tsarkœe-Selo. But the northern dialect, whose accents, irregularly distributed, form one of its difficulties, places the ictus on the ultimate vowel (Selo), whilst the Illyrians and the Slovenes,

minor settlements. Lying south of the new city, and north of a fine upland plateau rich in vines, it appears upon the map as Sventinovich, a mere corruption of Svetinj, the P. N. of the present proprietors, who, in Dalmatia as in Istria, often give names to the villages. The only remnant of this rustic capital is the chapel of the Gospa od Veloga (La Madonna del Villagio Grande). Velo-Selo was destroyed in A.D. 1483, by Ferdinand of Naples, and again in A.D. 1571, by the Catalonians and the Turks, under Sultan Sulayman III. The people have preserved the memory of the Ottoman Raid in their "Pisma," or songs accompanied by the single-stringed "gusle" or the three-stringed "Lira." As these hereditary legends are fast fading into oblivion, I may be allowed to quote a specimen.

Kukuriku Velo-Selo ;  
Do tri danka ne veselo ;  
Doci Turci, Katalani,  
Ostaćete svi poklani.

These rhymed hectasyllabics\* may thus be rendered :—

Arouse thee, Old-Town !  
Within three days, to thy sorrow,  
Come the Turks and the Catalans.  
All (of you) will be massacred.

The song, which has some eighty stanzas, and which shows undying hate of the Turk, refers to the "atrocities" of the day when, after vainly attacking Cuzzola Island, on the Fête of the Assumption (August 15, N.S.), 1571, the barbarians, headed by their Capodan, "Uluzali," fell upon Lissa, whose two wealthy and populous burghs were entirely unprepared ; and slaughtered the inhabitants of Velo-Selo. The words are supposed to be spoken by a cock which, standing upon the belfry-top of the Madonna Chapel, vainly warned the citizens of the horrors which awaited them.

The well-known volume of the Abate Kačić Miosić (*Razgovor Ugodni Naroda Slovinskoga, &c. Po Fra And. Kačicher Miosichiu: U Dubrovniku. Po Pet. Francu Martecchini. Edit. of Ragusa, 1 vol. folio, 1861*), also recounts, p. 177, the glorious defence of the Cuzzolans and of their leader Pomenić. The following three stanzas refer to Lissa ; and the old etymology is preserved :—

Zajceedri nevenselli Turzi  
Katalani nevirni Ajduzci  
Prija zozeh k' Visu dojedrisce  
Ter bogato sello porabisce

---

possibly affected by the Italians, prefer as a rule the penultimate (Sélo). Thus our captain's name is Lúsina in Slav, Lusina in Italian.

\* Whereas the old heroic songs of the Morlaks are mostly in blank decasyllabics.

Issikosce maloh i velliko  
 Jer se turkom medadasce nikko  
 Kakoseje ondà rassellilo  
 Ni danasse nije nasellilo  
 Tuh bih turkom pozlachiena Bada  
 Pak odosce de starogagrada  
 Onde turci mallo zadobisce  
 Vech Varbosku sello porobisce

Thus translated by Sig. Serafino Topich, to whose kindness I owe the loan of the volume.

Discontented went off the Turks, (and)  
 The Catalans, faithless Hayduks (*i.e.* bandits):  
 Before daybreak at Vis (*i.e.* Lissa) they arrived,  
 That wealthy settlement sacking.

They cut to pieces small and great (*i.e.* young and old),  
 These being wholly unprepared;  
 The massacre was so complete  
 That, until this day, it (the town) has not been re-peopled.

There the Turks collected enormous booty, (and)  
 Thence they went to Citta Vecchia (Stara-grad in Lesina);  
 Where the Turks little could rob,  
 Yet they plundered Verboska village.

Shortly after this last event, the Lissans returned to the seaboard, and built the Borgo, which has, therefore, no pretensions to antiquity.

In the early years of the present century, when Europe had not renounced giving "letters of marque and reprisal," the restrictions to which foreign trade was subjected by Napoleon I. produced an immense contraband along the Dalmatian coast and Archipelago. Lissa, then autonomous, once more became the favourite rendezvous of privateers who differed little from pirates, and was partially occupied by Russia. The demand for British produce and the central position of the island invited England to make it the centre of her naval and commercial operations in the Adriatic. She defeated the French squadron on March 13, 1811, and, on April 25 of the next year, she took permanent possession, establishing at the same time a local legislative body. On July 13, 1815, the English evacuated Lissa and the other islands, and, on the general Peace, these passed under the dominion of Austria, who, in 1848, abolished the invidious jurisdiction of Lesina. Finally the Italian fleet attacked the island on July 18, 1866, and two days afterwards was decisively defeated.

The actual trade of Lissa is chiefly contained in wine-growing and fishing. During my visit the city was literally red with the blood of the grape, even as Lesina was slippery with oil in December, 1874. The island maintains the celebrity of which

Athenæus (Deip. 1) speaks in the third century, 'Ἐν δὲ Ἰοσση τῇ κατὰ τὸν Ἀδριανὴν νῆσῳ Ἀγαθαρχίδης φασὶ οἶνον γίνεσθαι, ὃν πᾶσι συγκρινόμενον καλλίῳ εὐρίσκεισθαι; and which was asserted by placing the grape-bunch upon the coins. Fortis (1772), opining that the wine *non è gran cosa*, attributed its deficiencies to rude workmanship, or to the disappearance of the ancient growth. If this be true, the island has progressed of late. Her produce is now esteemed, and, whilst want of rain reduces the growth of grain to a fortnight's supply and causes cereals to be brought from Caramania and the Black Sea—no easy matter in 1876\*—a fair average season yields from 70,000 to 80,000 barrels.

The vines are trimmed short and supported by forked sticks. Throughout the Mediterranean regions, the old home of Bacchus, a glance at a vineyard, its stakes and its espaliers, tells the observant traveller where he is. The plant will outlast, in exceptional cases, the century, but the usual limits of its life are twenty-five to thirty years. The invasions of the *Oidium* have been met by the sulphur cure:† here the peasants, a frugal and hardworking race, eagerly adopt the innovations which benefit them, whereas their congeners of Istria and Carniola do not; and there is a noticeable development since the Islanders were freed from the government of rival Lesina. This superior intelligence of the peasantry explains the commanding position of their bit of island, in the days of old, when their colonies of Tragurium and Epetium were equally famous for their wines.

The grape is of eight chief kinds. The *facile princeps* is the Vugáva, a name of uncertain origin, well known to the other islands. This white berry ripens—or, rather, is gathered—in mid-August; it is delicate and liable to injury, and, being dried before crushing, the Eimer or Orna (=56 to 68 litres) of yield diminishes, in the process of manufacture, to some 9 boccali (40=1 Orna); hence many proprietors have given up making it.‡ This wine when kept for four or five years is of superior quality. Next is the Rukalać, also a small sweet white grape, yielding the "Muscato," or Muscadell; and ranking third is the Čerljenak, a red seed. Good average wines are made of the white Balbut, the Kerstićevica, the Biela Loza and the Palarusa. The cheapest is the Plavac, a dark purple

\* The closing of the Black Sea ports will probably drive the trade to the United States. The bread is the worst article on Lissa Island.

† The Islanders have not yet had an opportunity of experimenting upon the latest treatment by "mundic water," the vitriolic supply of pyritic mines.

‡ The same is the case with the "Refosco d' Isola," which requires the grape to dry, and all the stalks to be removed: hence a considerable diminution.

berry, more pleasing to the eye than to the palate. The peasants of the interior still trample their produce; the city uses the newest presses, and M. Serafino Topich has studied œnology in the well-known establishment of Messrs. Clossmann and Co., Bordeaux.

Vine-growing is the work of veterans and *emeriti*, who thus employ the year: in September and October comes the *Vindémia* (Vendange), when every able-bodied adult is engaged in carrying his harvest; and, at this season, five florins a-day will hardly bribe a guide to leave his work. The younger men willingly engage as sailors, especially between November and May: many have made long voyages, and not a few have learnt English and other foreign tongues. Fishing, which is secondary only to wine-making, employs the months of April and May, October and November. The principal yield is the *Sardella* (*Clupea*, or *Alosa sardina*), of which during a dark summery night 60,000, 100,000, and even 150,000 head have been taken by a single boat. A poor year produces from 8000 to 15,000 barrels, each weighing between 96 and 100 funti (1·2 lb. avoird.); in 1875 the yield was about 25,000. The other species are the Orate (*Sparus aurata*), and the Dentali (*Dentex vulgaris*) which, caught in winter, used to be prepared with gelatine for the Venetian market; the Sgombri (*Scomber scombrus*), and the Branzino (*Labrax lupus*), which is caught even in port. As usual off Dalmatia and Istria, the Astice (*Homarus vulgaris*) is superb; the poorest meat is the Rasa (*Raja*, or *R. clavata*), caught with the Parrangála, or long line, carrying 200 to 400 hooks. The nets are of two kinds: "La Tratta" requires three smacks, one leading with a light in the bows, and the others following with the net. I suggested for economy of fuel the trial of white-painted boards used by the Chinese on moonlit nights. "La Voiga," a Dalmatian, not an Istrian, term, is worked by a single craft with a crew of five, and only in the dark. Essentially a *rete d'imbrocco*, in which fish enmesh themselves, and a *Sardelliera* (used to catch sardines and anchovies), it is composed of *spedoni*, or square pieces, increased to as many as sixteen if the fish be in large shoals, and the depth is regulated according to requirements.\*

M. Antonio Topich has received a medal from the World's Fair of Vienna for his preserved sardines, anchovies and mackerels; specimens have also been sent to the Exhibition of

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\* Details concerning the Istrian fisheries will be found in "La Pesca lungo le Coste Austro-Ungariche," &c.), Memoria del Conte Antonio Marazzi, Roma, 1873), a large brochure. The industry in Dalmatia also has produced a little volume published during the Weltausstellung of Vienna (1873).

Philadelphia. He salts them to a certain extent, and then cures them with the finest oils: they are packed in tins made upon the island, with labels from Vienna. A century ago the main difficulties were the scarcity and the high price of salt: the necessities of the Austro-Hungarian Empire, like those of India, perpetuate the obsolete and unworthy gabelle; but the fishermen are favoured by Government, when they buy at Spalato the produce of the Istrian Salinas of Capodistria and Pisano. The general evil, here and in every item of the Dalmatian Archipelago, is the deficiency of communication: Lissa lies under the shadow of a great monopoly, and is limited to a single steamer-visit per week. Hence the abundant use of the telegraph, which is, however, somewhat like living on extract of meat instead of bread. Nor can the Islanders be held wholly faultless; they will not help themselves—they will call upon Hercules, the Government. Politics run high, and are aggravated by such retrograde *codino* or pig-tail (Ultramontane) prints as the 'Avvenire' of Spalato, a peculiarly vicious specimen. Local quarrels are fierce: it is popularly said that two Dalmatians cannot live together in a town without a quarrel; and yet I know of no race which to the stranger appears so genial and so sympathetic.

As the excellent vine is utterly neglected at Cherso, so at Lissa the olive does not prosper; and many declare that, like the date-palm and the cocoa, Bacchus and Minerva do not cohabit comfortably, as the "lamentable epitaph" says:

"Non bene conveniunt, nec unâ in sede morantur."

Fortis found a small trade in fruits of sorts; apples and pears, oranges and *agrumi* (lemons), melons and water-melons, figs and prunes, almonds, mulberries, and carobs: these are now barely sufficient for local consumption. The honey is excellent, despite a treatment worthy of prehistoric days; but it is produced in small quantities. The wool is poor, and the women use it in making *maglie* or *calze* (breeches). The only important form of "la petite industrie" is now rosemary-oil, of which the peasants annually retort some 20,000 funti (1·2 lb.), each worth from 90 soldi to nearly a florin. When the steamers touch at Lesina the passengers are offered small flasks of this essence, costing 20 soldi.\*

We cannot, I have said, expect to find ancient buildings at Lissa. In the back-streets behind the British Vice-Consulate you are shown the Popina-Kuča,† the Pope's Houses, where

\* The other curiosity of Lesina is a kind of lace made of aloë-fibre.

† Popina, the local mispronunciation for Papina, fem. of Papin, adj. Papal. Kuča, pl. of Kuć, a house. Hence the two heretical Russian sects, the Popovčina

Alexander III., when travelling from Rome, was received by Rainerius, Archbishop of Spalato. The little row of three old tenements is now tenanted by a Comisa family of the working classes, nicknamed by the people Muljat-Popini—Muljat the Papals. After leaving the island I heard of a "Phœnician tablet" built up in the house-wall of a certain Sig. Rendich, at the corner of the Piazza Opatia. The drawing sent to me by M. Serafina Topich shows a shield-formed field, 45 centimètres long by 35 broad, with a palm bearing fine branches on each side, and flanked by "Phœnician letters." Most readers will agree with me that the figures are more probably the armorial badges of some baronial house.

The ruins of the classical town opposite Lissa, which we shall presently visit, have proved, like Aquileja, a mine of antiquities. Here was exhumed the beautiful specimen of Greek art, the tombstone which attracts every eye in the Museum of Spalato. According to D. Apollonio Zanella, it was one of 17 ranged in two tiers, upper and lower. The local collections are all private, and it is regrettable that the Lissans have not set apart a room or two for their antiquities, which lose half their value by transportation. The city boasts of a reading-room, and a map-room; but the *Museo*, though often proposed, has still to be established.

At the British Vice-Consulate an upper room has been filled with the finds from Pelagosa, which will be noticed when we visit the island. The articles from old Issa are a massive semicircle of terra-cotta, like the upper vault of an arch; a corner-stone, probably of a tomb, with five colonnettes and six guttæ below; and a fine cotta medallion showing the head apparently of a Juno in high relief. The Reverend, summoned to Zara immediately after our arrival, could not show us his collection: the only items we saw were four noble specimens of the black and coloured ware usually called "Etruscan," œnochoës of claret-jug shape, the handles ending above in animals' heads. The Podestà, Cav. Pietro de Dojimi, an old and famous Lissan family, exhibited a large quantity of pottery, none equal, however, to those of the Abate; sundry coins of Roman emperors, and a few islanders. The moneys of the Issæi are mentioned by Fortis (ii. § 5, p. 164). In his day, however, only two types were known, one with an amphora and the other with a goat on the reverse, the obverse of both showing a helmeted head of Pallas facing dexterwise. The Biblioteca Patria of Zara \* in-

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(with priests) and the Bespopovčina (without priests), as opposed to the Yeress, or pure schismatics.

\* P. 173. Printed at Zara in 1863. The notices of the coins are by Dr. George Pullich, under the librarians SS. J. Danilo and J. Boglich.



forms us that some 600 specimens, between Greek and Roman, had been found: amongst them eight types, varying in diameter from 0·015 to 0·023, denoted those of Lissa. In most of them the obverse varies in minor points; one has a bunch of grapes, and the reverse with a horse pacing to the right, and the legend  $\Sigma$ . The reverses of the rest show the stag, standing or courant to right, or the goat standing and facing dexterwise. We were told of a coin bearing a galley, but I can find no notice of it in books; perhaps it was struck to commemorate some Roman victory.

There is a grand ossuarium\* of full size, and the finest glass, with scanty iridescence, which had been found in a pot and cover of coarse stone. The lachrymals are numerous, and the flasklet of blue glass, with a Medusa's head standing in high relief, on both sides of the lower and somewhat compressed bulges, is of admirable manufacture. Another gem is a ring of pure gold, plain and twisted above, a shape which might be found to-day: it was taken with sundry coins from an ordinary terra-cotta vase. In the façade of the Podestà's house are set two Greek inscriptions rudely executed.

Dr. de Dojimi, the eldest son of the family, who had travelled as far as Baghdad, accompanied us to the westernmost point of the Banda Piccola, where the antiquarian interest of Lissa begins. Here the open *place*, bounded northwards by vineyards and kitchen-gardens, bears amongst the Slav population the names of Mrtvila,† dead man's ground, or Grabišcie, the graves; and here, to the south of the classical city, lay the cemetery, as was usual in Dalmatia. It extends to the foot of the bulge still known as the Gradina (old town), a lump of limestone rock,‡ thinly covered with fertile humus, divided off by dry walls, and grown with many vines and a few carobs. In a garden belonging to the Podestà we were shown a standing pillar, with a Greek inscription not easy to decipher; two fragments of Latin inscriptions on broken slabs, and a large statue of white marble, whose head had apparently been borrowed from another.

The English visitor to Lissa will probably inspect the Cemetery at the root of the rocky headland crowned by Fort Smith, where lie the forty-five officers and men§ killed in action on

\* Many of these urns still contained bones almost consumed by the fire.

† Fem. plur. of Mrtvilo, from Mèrti or Mrèti, to die. In the Slovene dialect, further north, Mèrtvilo would signify "lethargy," or sleepy sickness. So Grob is a grave, and Grobje, or Groblje, a graveyard.

‡ The best maps and plans hitherto published depress the Gradina in favour of the Bandarica, the more substantial feature to the west.

§ A large proportion to the wounded, who numbered 145 (James), or about 1 to 4, showing the severity of the struggle.

March 13, 1811. Sig. Antonio Topich, one of the principal citizens on the island, has for years kept the graveyard in excellent condition, solely at his own expense. These memories of English prowess are often locally preserved, when at home, where men have other things to think of, they fall into oblivion. I rejoice to add that in 1875 her Majesty's Foreign Office appointed the generous islander British Vice-Consul for Lissa.

The Cemetery, which is not noticed by Wilkinson (1848), nor by Neale (1861), is reached by boat in a few minutes from the city. It is marked by the little chapel of Saint George and the ruins of a battery. At the entrance of the masonry *enceinte* are two inscriptions on slabs of white marble. That to the left tells us "I freddi avanzi qui sepolti sono dei Britannii Eroi che in mare perirono della patria in difesa e in onore del Trono." The other, in English, evidently cut at Lissa, bears the date MDCCCXV. The gate leads to a central walk, metalled with pebbles, and bordered with the luxuriant and graceful American aloe. The first monument erected over officers and men bears inscriptions which date Feb. 22, 1812; in the centre of the walk lies a flat slab, preserving the name "Honourable Charles Anson,"—his grandson, now in the Besika Bay fleet, lately placed on it a wreath of immortelles,—and easternmost, a pedestal, without date or legend, bears a scalloped cap somewhat like the funereal Turkish turban. Near the south-west corner, three heaps of earth cover the remains of sixteen Austrian artillerymen and infantry: they were killed on July 19, 1866, the day before the second naval battle of Lissa, by the explosion of the powder-magazine in Fort Smith,\* under the fire of four Italian ironclads, before the latter were compelled to retire by the Madonna Battery near the head of the harbour.

My first visit to Lissa ended (Sept. 27) with a walk to the Gradač, on the northern coast, about the middle of its length. Guided by Sig. Serafino Topich, we passed through the Banda Piccola suburb, remarking that, as usual in Dalmatia, many of the houses are approached by flights of steps. Traversing the Grabišcie, or Grave Valley, now well grown with grapes, we struck *the Dol*,† a longitudinal depression, which divides the island into two systems of highlands, the southern half being the more important. It presently becomes the Samogor, trans-

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\* Captain Brackenbury, in his able sketch of the action ('The Times,' August 14, 1866), calls this work by its Italian name of S. Giorgio.

† Meaning a valley in general: the diminutive is Dolina, a pretty word extensively used.

lated "bosco isolate,"\* and under the name of Valle di Kostrina it unites with the Vallone and Port of Comisa, distant about 11 miles to the west. In this direction the depression gradually rises some hundred feet towards the northern foot-hills of "Monte Hum," and the inverted ogive is protected by Fort Maximilian, at the beginning of the inclined plane, which falls towards the Western Sea. The principal wild growth of the soil, which is reddish like that of Istria, is the *Agave Americana*: its leathery skin, well provided with stomata, enables it, like the cactus of Africa, to live almost by breathing, to resist the most powerful suns, and to flourish upon the barren rock. This is the Maguey which supplies Mexico with the fermented pulque and the distilled mezcal. It thrives gloriously in its island home, whilst in India it loses its qualities, its beauty, and its majesty. The carobs had been frost-bitten. The average maximum of cold is  $0^{\circ}$  (R. =  $32^{\circ}$  F.), but in 1875-76 the temperature fell, I was assured, to  $-6^{\circ}$ , and even  $-7^{\circ}$  = (F.  $18\cdot50^{\circ}$  and  $16\cdot25^{\circ}$ ).

The peasants were busy driving mules, ponies and asses, laden with large skin-bags containing grapes partially crushed for closer packing; and all were exceptionally civil. The women wear sailor-hats, home-made of straw, and trim their hair in a single flat curl on each temple, suggesting the English "aggravator." Their husbands, especially when belonging to the Slav or national party, affect red caps, and the peculiar Montenegrin "fez" is not wholly absent. Hard work and harder fare have the usual effect: the good Maté (Matthew) Radissić, who accompanies us, is only fifty-two, and looks seventy. He quotes the proverb, "Acqua fa male e vino fa cantare;" but his untimely old age, poor fellow, owes less to excess than to want of it.

In the Samogor we saw the inland powder-magazine, at which many an Italian shell had been vainly directed. Most of Persano's officers had served in the Austrian navy, and they well knew where to shoot. From that point we turned north-west, and followed the rough foot-track winding up the lateral valley Drascovca. The total of an hour placed us at Zapaklinica,† where, according to local tradition, lay the city of Tenta, widow of Agron, who is known to every Lissan as Kraljica Otaka, Queen of the West(?),‡ and suggests the curious ques-

\* From Samo, alone (solus?), and Gora, a hill or an upland wood, the Spanish Monte. In Slovene Sámó would mean self, e.g. "samoljubac," a self-lover, an egotist.

† Pronounced Zápaklínitsa. Some derive the word from Kopati, to dig, grub: others translate it, at the little pitch (-pine hill). Pakliti would mean to apply Paklina or pitch: Pakla is Hell. In fact the etymology is dubious.

‡ The people translate the word Queen of the East, which is Istok (Iztok).

tion whether *Teŭta* is a corruption of *Otaka*, or vice versa.\* The historians of Rome tell us only that the first Illyrian war was caused by the unrepressed piracy of her subjects; that she vainly attached Issa (B.C. 229), which had placed itself under the Ægis of the great Republic; that she assassinated one of the two brother-ambassadors sent by the Romans, and that sundry defeats compelled her to buy peace (B.C. 227–28) at the cost of paying tribute, and of yielding her fleet, together with the greater part of her dominions. But we are nowhere told that the gallant Queen ever dwelt at Issa.

Nothing can be more charming than the site of Zapaklinica. The city, now a succession of small vineyards parted by dry walls, rose at the head of a slope gently falling towards the deep blue waters on the north-west. Eastward, or to its right, swells the bush-clad *massif* of Vissokaglavica: † it is fronted on the west by the “Kompris,” banded with naked rock, and by the “Smokvaglava” or Figs’ Head—Raas el-Tin—similar in

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opposed to Otok, the west. Possibly *Teuta* may have been a royal title, not a name, for we find the first wife of Agron called *Triteuta*.

\* Fortis, when discussing the origin of the Morlaks (vol. i. c. 2, p. 45), adduces the following 20 names of towns, tribes, and persons, from the classical historians and geographers, to prove that the Slav tongue was spoken in Istria and Dalmatia during Roman domination; *Pronona* (P. N. of City, Keltic?), *Alvona*; (*hod.* Albona, certainly Keltic); *Senia* (Senones?); *Jadlra* (corrupted from Diodora or v. v.); *Ratauncum*; *Slupi*; *Uscana*; *Bilazora* and *Zagora* (both significant in Slav); *Tristotus*; *Ciabrus*; *Ochra*; *Carpatius*; *Pleuratus*; *Agron*; *Teuca* (*sic*); *Dardani*; *Triballi*; *Grabæi* (significant in Slav); and *Pirustæ*. He notes three Greek similarities, evidently borrowed, viz., *Spugga* (σπύγγος); *trapeza* (τράπεζα, like Sanskrit); and *Katrida* (καθέδρα); and he might have added *Gispod*, from *Δεσποτὴς*. He gives 12 Latin resemblances: *Salbun* (Sabulum); *Knin* or *Klin* (cuneus, a wedge); *Plavo* (flavus); *Slap* (lapsus aquæ, waterfall); *Vino* (vinum); *Capa* (caput); *Rossa* (rugiada, dew); *Lepto* (lepidus); *Zip* (lippus); *Sparta* (sporta); *Skrinje* (serinium); and *Lug* (lucus). He quotes also 12 Italian forms, besides 10 Venetian words, which are evidently borrowed from the Wends, viz.: *Abbajare* (oblajati), to bark; *Svaligiare* (svlačiti), to strip of baggage; *Barare* (vacare or variti), to cheat; *Tartagliare* (tarlati), to stutter; *Ammazzare*, to kill, from *Maç* (mač), a sword, and its derivations, *Maçati* (mačiti), to fight, fence, put to the sword; *Ricco* (srichian), rich; *Tazza* (čassa); *Coppa* (Kuppa); *Danza* (tanza); *Bisito*, an eel, the common term in Istrian Italian, from *bixati*, to run away; *Bravo!* (Pravo! same sig.); *Briga* (briga), a quarrel. He ends the list with 13 English similarities; *Stina*, stone; *Mese*, meat; *Med*, mend, honey; *Brate*, brother; *Sestra*, sister; *Sin*, son; *Sunze*, sun; *Smule* (glass, mule?); *Mlike*, milk, *Snig*, snow; *Voda*, water; *Grab*, grave; and *Srebro*, silver.

He also anticipates the learned Mr. Edward A. Freeman in noting (i. 2, p. 47) that the Dacians spoke a Slav tongue. As regards the vocables quoted above, if the old Illyrian be represented by modern Albanian, it probably had Indo-European, and especially Keltic affinities, and thus we may explain the remarkable family likeness. It is much to be wished that these words should be examined by Keltic scholars. Finally, though the subject is far too extensive for anything beyond mere mention, I would express my surprise at the modern theory of Schleicher and others concerning the comparative antiquity of the Slav family of languages, than which nothing can be more Sanskritic than Sanskrit itself.

† In Italian rendered “piccola testa alta,” high little head, from *Visok*, tall, and *Glavica*, dim. of *Glava*, a head, a headland, and so forth.

form, but somewhat greener. In front lies the Porto Gradač, an irregular triangle of clear blue water, edged and scalloped with leek-green, forming a natural "Mandracchio," or dock: the cove is parted by a promontory with outlying rocklet, from its western neighbour Porto Chiave. Regular excavations have not yet been made at Zapaklinica, but many remnants of antiquity thence find their way to the city.

Enjoying the cool prospect of the waves below,

"A bowery hollow crowned by summer sea,"

a bath fit for Venus Anadyomene, we wound along the western shoulder of the Vissokaglavica by an elementary track through the luxuriant semi-tropical bush. Here we remarked the Terebinth, the Myrtle, the Arbutus, and the Arum; the Phillyrea (*media*) and the "Divlja Maslina," or wild olive; the pretty heath (*Erica multiflora*), and the lentisk, which supplies the Mastikhe of Chios, the only island now producing the noble gum on a large scale; the Juniper of the two normal species, especially the *J. macrocarpa*, with edible berries; and the pine (*P. maritima*), which towers over the humble growths.

After thirty minutes' walk we struck the neck of the Isthmus that forms the eastern pier of Porte Gradač; and we rested at the Taddeina-gradja, a line of low cattle-sheds roofed as usual here with Zimble or slabs of fissile limestone: the place takes its name from the family that owns it. Thence we proceeded to the headland still called Gradačski-rát\* or "old town point"; where the castle of Queen Teuta is placed by local tradition, and where she buried, before her flight, the treasure vainly sought by a host of gold-hunters. The greater length of the little peninsula stretches to the north-west, and is cliff-bound and precipitous everywhere save towards Porte Gradač on this south-western side. The easy slope shows two modern cisterns. The *terre pleine* bears evident signs of levelling, and the thinness of the soil, which is not worth ploughing, has preserved it from disturbance. The circuit has been walled wherever access was possible: in most parts the foundation is level with the ground; but at the neck there is a tall mound of débris which might prove productive. Across the narrowest part stands a fragment of wall, 15 mètres long by 2·30 high and 0·80 thick: the cement contains water-rolled pebbles as large as almonds: this defence, which, at Lissa, was described to us as classical, may have been built by the Venetians or even by the Slavs, possibly on an older base. The point commands a lordly view

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\* Rát, meaning a headland or rocky point, is a frequent ending of words in maritime Dalmatia.

of the beautiful islands and highlands of middle Dalmatia, disposed in successive vanishing tiers of white limestone, dyed azure by the limpid air; and to the west over the deep-blue sea, and distant some 33 miles, lies the Pomo-rock,\* exactly imitating a ship under full press of canvas—the tradition is that during some war it was cannonaded by mistake.

From this commanding ground we could sight the spot where the *Ré d' Italia* underlies 200 fathoms of water. The second battle of Lissa was fought on July 20th, 1866, about 10 miles north of the harbour.

We returned to the city by a shorter cut along the eastern flank of the "high little head"; in full sight of the Canale di Lissa, where the Embatte or sea-breeze was creeping down from the north, ruffling the waters into a deeper blue, while the smooth azure slept near the shore. Every bit of plain and hollow had been turned into a vineyard: houses were scattered here and there, and the peasantry of both sexes and all ages were merrily gathering their grape-clusters. The panoramic view of Port Saint George and of Lissa City, faced by its purple bay, and backed by its stony and bushy hills, was as pretty a sight as man would wish to see.

A third rough foot-path debouched upon the venerable Gradina, the classical old town. The site is a bulge of ground rising to the north-east of the Mrtvila flat, and connected by a gentle slope with the higher hills behind on to the north. It is separated by the cove known as the Porto Inglese from a similar hillock to the north-east: here they say appeared a Latin inscription locally believed to "commemorate the defeat of Queen Teuta by a Roman centurion."† It was published by Mommsen (I. 177) luckily before the stone, which measured 80 centimètres by 50, was broken and built up in the nearest

\* In Slav Jabuka (Yabúka), also meaning an apple. An attempt was made to ascend it, in the spring of 1876, by Herr Spreitzenhoffer, an employé of Government at Vienna, accompanied by Sig. Serafino Topich: the weather was so bad that the explorers could not even land.

† I could not procure, either at Lissa or at Trieste, a copy of Mommsen's *Corpus Inscrip. Lat.* The following transcription was kindly forwarded to me by D. Apollonio Zanella, who declares that it was found (1859) in the Gradina upon the property bearing his family name:—

Q. NVMERIVS. Q. F. VEL (velina)  
RVFVS. LEG. PATRON.  
PORTICVM) REFICIVNDVM.  
DE. SVA. PECVN. COER. (curavit)  
IDEMQVE. PROB.

Sig. Ljubic has also published it in the Fasc. xxxi. of '*Rád Jugoslavenke Akademije*' (Agram, 1875), in which he attempts to complete the series of the Prætors, Legates or Lieutenants who governed Dalmatia in the Roman days.

Martello-tower, shortly before the affair of 1866. Since the historian's visit, some 14 years ago, the work of destruction was continued; and the remains of the Roman hypocaust in the Podestà's property have been buried. The ground, which doubtless still covers many a relic of old Issa, is broken by loose walls forming terraces for the vine: it has, I have said, been a mine of plunder for collectors; and the rains still wash from it coins in quantities, rings and scraps of corroded metal, Cotti of all kinds and the normal cubes of coarse mosaic. The only sign of actual excavation appeared in a cistern, revetted with the finest lime-cement: the contents were brown earth and dusty débris mixed with broken pottery. The foundations of the old walls *in situ* are easily recognised by the size and cutting of the stones: in sundry places the natural rock has been trimmed and squared; and the superincumbent masonry evidently belongs to a later date. The lowest level was occupied, according to local legend, by the Forum: here the inscription was found, and here a worked monolith is an undoubted remnant of antiquity.

The whole sea-face of the Gradina is fronted by a modern dry wall, within which are the walls of the older *enceinte*. To the north-east are two masses, apparently turrets, while various tall outstanding buildings, mere shells and shreds of cut stone and lime, rise from the vineyard to the south. We noticed a number of ancient remains built up in the dry wall, such as the volutes of a capital and the pediment of an altar. Nearly opposite the Velinin,\* the little maritime powder-magazine, built not by the English but by the Austrians, is the trunk of a statue, fine Carrara-like marble, 6 feet 5 inches (Austrian) in height, with toga and sandals, the latter apparently unfinished. It was found about 15 years ago in the Podestà's property; and possibly it adorned the forum or the portico referred to by the inscription. The arms are broken off, and the head, bought with five florins, they say, was sent to Vienna by M. Hoffman, a classical captain in the army. At the easternmost bend of the same wall, there is a torso of smaller size, also clothed: its imperfect condition masks to the non-professional its style and date.

From the Gradina we walked to the Point and Convent of S. Girolamo, now a natural mole projecting from north to south, fronting the city and defending the Stanza, or dock, to its west. According to tradition and appearances, it was an island: the narrow channel connecting it with the mainland, and once bridged over, has been filled up by time, whilst around it there

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\* Meaning the "Great Wall," so called from a feature once existing there.

are traces of a similar subsidence,—a movement not confined to Lissa. We failed to find the subaqueous mosaics mentioned by Fortis (II. 5, § 1, p. 162), and repeated by Maschek (p. 114 'Manual for 1873'); but the northern shore shows beneath the water large cut stones, supposed to be a mole. A shell of Roman theatre, with the arc opening southwards, forms the terrace of the convent-hospital: the solid masonry at once strikes the eye, and the large stones conceal a core of hard rubble bedded in mortar. The latter was mixed with the usual coarse gravel, and in places we remarked the bits of pounded brick, which in England are held evidences of Roman workmanship.

The convent is rich, and its tenants, the *Minori Osservanti*, have large estates upon the island. Don Girolamo Marinković, the Padre Guardiano, showed us with some pride a "veritable pepper-plant" growing in the garden. It proved to be the pepper-tree of Gibraltar (*Schoenus mollis*), a very different affair, probably introduced by Bill Smith. We also visited the monuments of the thirty-six artillery-men and marines killed under Tegetthoff. The latter were covered by a lion couchant, of tasteful work, by the sculptor Botinelli, domiciled at Trieste. The Italians seem to have thrown their shells without much discrimination: several of the missiles, still unexploded, were rolled by the children down the hill-sides, and some fatal accidents followed the bombardment.

We had not time to exhaust all the memorabilia of Lissa. D. Apollonio Zanella recommended a visit to a tumulus called Stavelo, the place of rest, on the south-eastern shore, near the Valle Rûda, or the Mine. He spoke also of the Caverna di Pretišjana, near Taleska Bay, which we shall presently sight on the mid-southern length of the island, a double feature, whose western section may contain traces of pre-historic man. Above that portlet also are found, on a conical hillock, scatters of cut stones, possibly belonging to an older day. Many of them were used by Signor Topich in 1866, when building the tower which served as a *corps-de-garde*. For additional information he referred us to D. Pietro Borčić, Parroco of Comisa town; to D. Simeone Pietrić; and to D. Antonio Mardossić, who lives upon his own property inland. Even the vulcanism of the Comisa district deserves study. Fortis \* heard of igneous matter; the people talk about conglomerate of lava at the Scoglio Brusnik, alias Molisello; and

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\* Viaggio (ii. 5, § 1, p. 166). He mentions Donati's 'Saggio d' Istoria Naturale dell' Adriatico,' and he here shows a wise sceptical or scientific spirit.



my learned and excellent friend, the venerable Cav. Muzio de Tommasini,\* of Trieste, found near Comisa a diallagite like that of Busi Island, and suspects trachyte. Diallagite is mentioned also by Franz Ritter von Hauer (p. 368, 'Die Geologie,' &c., Wien, 1874). Finally the Comisans show a deposit of gypsum, which may have been converted by heat from carbonate into sulphate of lime.

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## PART II.—*Pelagosa.*

I. *The Voyage; Landing.*—Early on September 23, 1876, *La Pelagosa* steamed out of Lissa to inspect the youngest and the finest of the sixty lighthouses, with which Austria has provided, at a considerable expense, her Adriatic seaboard. Very lovely, even in the dimming scirocco, is the view from the mouth of glorious St. George's harbour. In front, distant some 12 miles, is Lesina, with its ex-French town and port, and its forts Napoleon and Spagnuolo: here low-lying, the island towers high and broken to the east. Behind it rises the dark dorsum of rugged and roaring Brazza, "Capris laudata Brattia;" while the continental horizon-line shows the nick of historic Clissa, acropolis of Salona; the pyramidal buttresses of the Mossor (Mons Aureus), and its prolongation, the Biokovo, or White Mountain, whose pale and tormented brow is faintly streaked with azure light and bluer shade. When the sharp Maestrale (north-wester) has purged the air, the sun picks out every feature with startling distinctness; and, as the last glories fade in the waning grey, the mountains become the wan and unsubstantial phantoms of what they were,—imperial giants, robed in purple and gold. Looking backwards we see the ridge-line west of Lissa city, crowned by the two chapels of SS. Cosmo and Andrea. The Scotchman, being the taller, has been used for an "optical telegraph;" while "Monte Hum," the island-apex, backs, with its naked and couthless form, the fair scene of harbour, city, and bushy slope.

Beyond the jaws of St. George we pass to port a low white rock, "La Vacca," whose two "Manzetti" (bull-calves) we had sighted when making Lissa. Beyond it, to starboard, stand Le Strazzine, tall cliffs, jagged and abrupt, upon whose sea-lashed base, during an Ostro-Scirocco (south-south-easter), an English man-of-war narrowly escaped wreck, with the loss

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\* Since these lines were written, my excellent friend died full of years and of honours.

of her masts. Between this wall and the Promontore, the easternmost projection of the island, the inclines wear a coat of lighter and livelier green. Our Lissan companions remember the days (July 18-20, 1866) when the hill-sides were aflame with the shells vomited by ships and batteries. While the second great naval battle of Lissa was fought about 10 miles to the north, here the land preserves many a memory of the English victory. Beyond the Bight of Strončica,\* translated the "little *Approdo*," or landing-place, we were shown the position of the submerged rock, upon which Captain Hoste, by bold and skilful tactics, succeeded in grounding his dangerous enemy, *La Favorite*, the forty-gun frigate of the gallant Commodore Bernard Dubourdieu. Here the latter, together with his captain and a crowd of the crew, assembled on the forecastle to board the *Amphion*, were killed by the discharge of a "brass 5½-inch howitzer, loaded with 750 balls." It is well to "REMEMBER NELSON," but I hope that some future James will do more justice to the memory of the brave French sailor.† Off that bight, now called "Little Smokova," in Italian "Porto Figueira," where the Torre Telegrafica now stands, *La Favorite*, commanded, after her double disaster, by Colonel Alessandro Giffenga, with an Enseigne de Vaisseau to work her, was set on fire, and at 4 P.M. "blew up with a great explosion." Some of her guns, they say, are still to be seen under water.

Beyond the fine lighthouse which garnishes the Promontore di Lissa, and the "Great Smokova" bight, we sighted the islets forming a false coast along the eastern and south-eastern shores. The first is the "Greben" (*Pectines*),‡ a name and a feature equally common in the Dalmatian Seas; bare rocks with comb-like crests, and bluff to the windward where the Scirocco breaks. Next comes the distorted triangle Budicovač, a two-hilled well-wooded dot tenanted by vine-cultivators: the unfortunate Emperor Maximilian had thoughts of buying it, and probably he was not its first admirer, as two Roman coins have been found there. One of our party, translating the name "Become thou" (budi) "a smith" (kovač), argued the presence of metal, possibly of mines. But the learned D. Apollonio explained the title as "La Sentinella" from buditi, to wake, to keep awake, either because the fishermen here posted a man to look out for squalls, or because the ground is high compared with the little Zaüle (Sleep!), the low rock to the west. I was

\* In the Hydrog. Map also Stončica, probably a local corruption of Strančica, s. fem. dim. of Strana, side, flank, slope.

† 'Naval History,' vol. v. pp. 253-56 and 351-53.

‡ The generic Slav word reappears in the Italian "greppi," precipitous cliffs.

reminded of a great Istrian antiquary who found at Castel Venere a stone bearing

M. M. C. F. F.;

and incontinently rendered it "Marcus Metallus Caji Filius Fecit." It was the old tale of "Bill Stumps his Mark;" a peasant seeing the citizen carefully copying the legend, explained it as the work of his father, and read *Mistro Marco Cocetto fese (feci, fecit) fare.*

South-west of Budicovač lies the Scoglio Ravnik ("flat rock"), an arid level whose only claim to notice is a veritable *grotta Azurra*. Dr. Coglievina (*loc. cit.* p. 395) describes it as a tunnel in the limestone cliff, with a two-arched entrance formed by a natural column; and with a remarkably regular interior about 40 feet wide, into which the magical light penetrates by a spiracle, opened in the dome as if by the hand: he declares that in the poetic days of the Greeks this grot would have become a bower for the Nereids. Steaming nearly due south, we left to starboard, and south-west of Lissa, the tall islet-rock Busi: here some 30—40 Corydons feed their sheep and goats, living on milk and fish, a leprous diet, and on bread and wine sent by their employers. Further to the north-west, and 18 miles distant from Comisa, rises the Scoglio Brusnik (the Whetstone) or Molisselo, famed for a peculiar lizard with a coat like black velvet. Two and a-half miles to w.n.w. of it is S. Andrea, possibly the Pityeia of the old Greek poet; rich in ilices and junipers, it still bears the *Pinus maritimus*. Here also live a few shepherds, not without danger, as seven were carried off by a storm-wave on December 2, 1869. An ugly deed is connected with this skerry. Shortly after our evacuation of Lissa (1815) an English vessel was wrecked on the Kajola Rock off Pelagosa, and the crew, taking to their boat, made Saint Andrew's isle; where the skipper's belt, supposed to contain gold, caused the murder of all hands, except a boy, whose witness led to detection. The criminals died in jail: "carcere durissimo," with its bi-weekly flogging, was certain doom in the days of the "paternal government;" and even now it seldom outlasts the tenth year. Last and westernmost of the scatter, 12½ direct geographical miles w.n.w. from St. Andrea, is Pomo, the Apple, a barometer which rises from the sea only in the finest weather.

A glance to port shows us lumpy Curzola (Korkyra melaine). Hereabouts the Venetians were defeated, with the loss of 66 galleys and 7000 men, by the Genoese (Sept. 8, 1296), when a certain Messer Marco Million (Milione) was taken prisoner. Backed by the lofty and weather-beaten peninsula of Sabbion-

cello with its Acroceraunian brow, it is protected southwards by Lágosta and dots of islets. The most westerly of the latter is La Cazza, the Ladle, and the name explains itself as we pass by: the inverted bowl is the bare and dome-shaped northern hill, some 780 feet high, and the handle is the long low Point Gradiska, sloping to the south-west and ending in a dwarf bulge upon which a lighthouse is being built. A castle, mediæval and probably piratical, has left traces upon the slope of the quartz eminence;\* and the barren-looking rock supports "pastors:" they are permitted to keep their favourite goats.

We steam slowly, for *La Pelagosa*, whose maximum speed is 9·2 knots, rolls heavily under the Scirocco with sea abeam; and about half-way between the islands, our destination begins to rise from the blue bosom of the waves, in the shape of a rudimental turret-ship, a lumpy line crowned by a point. Presently it developes itself into a regular profile. Beginning from the east are the two small jagged rocks, the Kamik Tormentone,† and behind it the Scoglio Ostre (southern); further west is a comparatively large dome, the Mala or Piccla Pelagosa; and westernmost, its occidental outliers being hardly visible, rises *the Pelagosa*, a long dorsum of dark rock, culminating, when it faces the setting sun, in the "Castello," a fine pyramid about 100 feet high, and crowned with the imposing Pharos. There is naught around it but sea and air; nothing to give a measure of comparison; and, despite the humble altitudes the aspect of the "Ocean-isle" is at once grandiose and picturesque.

Before landing, we will briefly note what has been written concerning Pelagosa.‡ Ancient history ignores it, either on account of its situation, or, possibly, making it an outlier of the Diomedean (Tremiti) group. We can hardly connect the name with the Macedonian Pelagonis bounding Illyria,§ nor with our old friends the Pelasgi or Pelargoi (archaic Greeks). The word suggests an Italian, not a Latin, derivation from Πέλαγος,|| the latter word being used in these seas: for instance "S. Giovanni in Pelago," the miraculous island south of Rovigno. But we are unable to fix upon the date at which it was given.

\* A plan has been supplied to me by the kindness of M. M. Topich; but I prefer not to describe the site before making a personal inspection.

† A local corruption of "Tramontana," the north wind.

‡ It should rather be called Le Pelagose, as the two main features are quite distinct. James (*loc. cit.* p. 256) calls it "Pelagosa," but he also transforms (p. 363) Parenzo into a feminine "Parenza."

§ Strabo, vii. c. 7, § 8, &c.; Livy, xlv. 29; Pliny, iv. 17, &c.

|| Otherwise, the form would be the classical "Pelagia" (πελάγια) or Pelagica (πελαγικά), meaning the Marina; as "pelagia concha," the shell-fish that produced pearls.

Our principal modern authority is the Abate Fortis (ii. 5, § 1, p. 162), whose description, slightly abridged, is as follows. "The island of Pelagosa lies 60 miles from Lissa, and a little more or less from the promontory of S. Angelo in Puglia (Apulia).\* The main rock, and the smaller features which rise from the sea in its neighbourhood, are remains of an ancient volcano. I would not assure you that it has sprung from the waters like many other parts of the Archipelago, although this is suggested by the silence of the oldest geographers. Apparently it should not have been confused with the Diomedean group (the Tremiti), distant some 30 miles, yet this confusion may possibly have taken place. *The lava which forms the skeleton of the island most resembles the commonest matter erupted by Vesuvius, as far as we could judge when sailing along it.*† If some naturalist would visit its highest points we might learn whether it has been thrown up by a submarine volcano, like the islet near Santerini (Santorin, of old Thera) in our days; or whether it was the summit of some ancient cone of eruption, whose roots and slopes were buried in the waters when the Strait of Gibraltar was formed, an invasion which cannot be doubted by those who have examined the bottoms and the coasts of our seas. The fishermen of Lissa declare that violent earthquakes are often felt there;‡ and this would appear from the aspect of the island which is rugged, ruinous, and broken into fragments." So far Fortis, who has been copied and mis-copied into those mines of errors, popular Cyclopædias and Gazetteers.§

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\* The Abate measures by the short Italian mile of 4000 feet, not the Austrian of 6000, and in purely topographical matters he is not always trustworthy.

† The italics are mine. As will be seen, the signs of vulcanism at Pelagosa are rather latent than striking. The learned Abate had a personal knowledge of Vesuvius, and, as he takes care to state, he only sailed past Pelagosa. In making this and other features comparatively modern, that is after the date of the classical geographers, he was guided by the opinions of his day and the era mis-assigned by his Church to the "Creation."

‡ We shall see fatal signs of these movements the moment we land.

§ Knight's 'Cyclopædia of Geography' (Bradbury and Evans, 1856); J. R. McCulloch's 'Dictionary' (Longmans, 1866), and the Engl. Trans. of Lavallée (Stanford, 1868), clean ignore it. Fullarton's 'Gazetteer of the World' (London, 1856), says, "Pelagosa or Pellagosa, a small desert isle of the Adriatic, 42 miles south-west of Logosta Island; and 32 (read 26) miles from the coast of the Capitanata in N. Lat. 42° 21' 30" (read 42° 23' 41") and E. Long. (G.) 16° 15' 50". It is surrounded (read "bordered to the east, to the west and to the south, the north being clear") by dangerous rocks, of which the principal (probably the "Kajola," Norie's Cajola) is in N. Lat. 42° 21' and E. Long. (G.) 16° 19' (Norie, N. Lat. 42° 23' and E. Long. 17° 22'). It affords fine marble" (the only marbles are a few imported fragments). The latest reference, in A. Keith Johnstone's 'Dictionary of Geography' (New edition. London. Longmans, 1863), thus runs: "Pelagosa is a desert island in the Adriatic Sea, midway (a rough computation) between the Promontory of Gargano, South Italy and Dalmatia."

It may be as well here to state at once the conclusions to which our researches led. The sea about Pelagosa, being abnormally rich in fish, naturally attracted honest labour, and the latter, pirates and water-thieves. One of the finds suggests that it was a battle-field and a burial-ground for men of the Stone Age. It is not without signs of Etruscan occupation; and it was regularly inhabited by the Romans, Pagan and Christian: almost all their remnants seem to be sepulchral, as if they had converted the rock into a cemetery.\* From documents still preserved in the archives of Lesina, we learn that during the supremacy of Venice (thirteenth century), the noble Lusignano house of Slavogosti, being exiled by the "Serenissima Republica," took refuge in the Rock and there built a stronghold. These fugitives practised every manner of oppression upon the hapless fishermen till their den of thieves was razed to the ground by the suzerain power. Probably to these days we must refer the ten skulls and the heap of bones in the Topich Collection. All are comparatively modern, and show the orthographic-brachycephalic form with prolongation of the parietal bones, except a lower jawbone† almost petrified, with the roots of four teeth converted into a friable yellowish substance.

When the coast was clear of Corsairs, the fishermen of Lissan Comisa built, upon the central plateau, a rude little chapel dedicated to St. Michele. Pelagosa was claimed by the kingdom of Italy, which occupied it provisionally; and retired only when the Comisani proved their rights by producing ancient documentary evidence. The trigonometrical bench-mark, dated 1869, shows that it is now under Austrian rule.

After these preliminaries we proceed to land. The usual course lies to the west of Pelagosa, outside three detached fangs, the Manzetti, in Slav Volić;‡ and the navel-like Scoglio Pampano or Perpak: they are separated by a deep-sea channel from Point Kapič, on the main feature. On the south-western flank of the Castello block towering above us, we remark a sloping plainlet grown with *Artemisia*: here, as will be seen,

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\* The distance from Lissa and the other larger islands may suggest difficulties: but we are not without example. Fortis (i. 4 § 7, pp. 164-65), when describing the Scoglietto di S. Stefano, west of Sebenico, explains the presence of Roman tiles, urns, and mortuary inscriptions, one of the latter robbed of its bronze letters, by the fact of its having been a Sepolcreto "according to the praiseworthy customs of the ancients who, wiser than the moderns, removed far from their settlements the corruption of corpses and thus prevented the dead injuring the living."

† Found in the Cava or new quarry, as will presently appear.

‡ Plural of Voliki, a bull-calf; from Vol, an ox.

were found traces of habitation. After 5 hours 30 minutes of slow progress, we passed to port the "Zuffi" (Prongs), two sharp and comb-like ridges of sea-blackened limestones, trending nearly north—south, and rising sheer from the clear depths of blue and green. We left to starboard the dangerous Kamik, Sasso or Stone, which, viewed from above, resembles not a little the "Dog-rock," at the mouth of the Lycus River of Bayrút. It is also called Sika or Sikka, a corruption of the Italian "Sicca" (shoal), and must not be confounded with the Secca Mina to the south of Little Pelagosa. Between the two main islets lies "breeches rock," the Gaće, or Scoglio Braghe,\* and, finally, some 3½ geographical miles to the S.S.E., lies another rock, awash and separated from the main feature by a clear deep channel. This is the Kajola, a Slav corruption of La Galliola (= galiggiante, the floating); and here the English merchant-craft was wrecked.

To the north of the "Dog-rock" lies the southern landing place, the Žalo,† meaning Spiaggia or beach; a strip of shingle about 100 yards long, which can hardly accommodate more than ten to twelve fishing-boats. They must transfer themselves to the north-west, when the dangerous Scirocco blows, at times raising the water 15·2 feet above its normal level; this fierce south-easter has thrice washed away the solid bit of stone landing-pier. The peculiarity of the Žalo is the perfectly rounded shape of the water-washed pebbles: some are regular as old musket-balls, and have been carried off by the fisherman to serve as "boccie" or bowls.

The east end of "the Strand" is called Pod-forano, referring to its being under the Lusignani. Here, about a century ago, 4 or 5 smacks belonging to the rival island were drawn up, and the crews were ashore, when 20—25 of them were crushed to death by a rock-slip, the result, they say, of an earthquake. Since that time the people of Lesina have abandoned the Žalo to the Comisans. Strong retaining walls of masonry have been built to prevent such accidents; but the cliff in places overhangs, and we were shown a boulder which had lately fallen upon the shingle beyond the defence. Nothing, indeed, can look more unsafe than the foundation of the island generally: the insecure base, as throughout the Archipelago, and many parts of the coast, is a stratum of schist, here slate-blue, there ochre-yellow, which crumbles when dry, and which melts and becomes sippy

\* On the S. Francisco River I found a cachoeira or rapid called Tira-calcoens —i.e., "Take off your drawers" (for easier swimming).

† So pronounced and written: a more correct form is Žal or Žalo (Zhal, Zhalo), a coast, bank.

when the rains drain down to it through the fissures from above. Upon this loose argillaceous formation is built the tottering wall of limestone and of hard siliceous breccias. The first aspect suggests that some day Pelagosa may sink as suddenly as it is supposed to have risen.

We will reserve for a future day a careful inspection of the sites where the "finds" appeared; and at once proceed to lodge ourselves at the Lighthouse. A zigzag of 9 ramps, the painful and laborious work of the last three years, leads from the Žalo to the summit of the cliff, and here we find the platform of S. Michele, some 165 feet more, exactly 55 mètres above sea-level, and the only flat bit of building-ground on the upper island. A few yards of *strada d'accesso*, or level road, lead to the second or short zigzag of three ramps, which ascends "Il Castello," the turret of the "last Austrian ironclad." This was the fisherman's name for the tall castellated mass which forms the west end of the island; the apex of the comb or ridge, rising 332 feet above-sea level, bluff to the south, and of gentler inclination northwards. It was hardly accessible when the Pharos was planned; and the works began by laying out the zigzag, and by cutting off 3 or 4 feet from the head to gain a level. The material, a dark flinty limestone, was mistaken for gneiss and granite; the fracture is subconchoidal; it melts in nitric acid, leaving a residuum of siliceous grains; it is generally unfossiliferous, and its character suggests exposure to great heat.

The Pharos, which is perhaps the best on this coast, was built by Sig. Antonio Topich, a contractor whose name is associated only with hard and honest work. The engineer was M. Richard Hänisch, who enlarged the plans and carried out the works prepared in the office of the President of the Maritime Government, Trieste. He began his local studies in 1874, and he visited the island six times, some visits lasting three weeks. The first stone was laid on May 19, 1874, and the average number of hands employed was about one hundred. The estimates asked florins 50,000; but unforeseen difficulties raised the sum to 85,000; not including 62,000 francs for the lighting apparatus, and 18,000 francs for its iron dome and other necessities. Thus the construction, of admirable strength, cost only about 12,000*l.* It was first lighted on September 20, 1875: its orbit covers 500 square kilomètres, and it is equally visible from the Pharos of Lagosta Island, and from that of Italian Viesti upon the Promontory of Monte Gargano. The apparatus is of the latest construction, and nothing can be more picturesque than the eight broad rays of light cleaving, like swords, the glooms gathered around.



The only inhabitants of the island are the employés of the Lighthouse, 5 assistants and 2 women. All their supplies are imported, even water: the last item costs some 2000 florins per annum. We found large and comfortable rooms; and passed there the four days between Saturday and Monday, whilst the steamer retired from the open and unsafe anchorage to Lissa. We had reason to be grateful to M. M. Topich, who had the happy thought of carefully preserving, despite a hundred' difficulties, every remnant of antiquity which was unearthed by the workmen, and to M. Hänisch who, when not officially employed, accompanied us on our several short excursions, and showed the value of extensive local knowledge. To the latter gentleman I also owe some admirably drawn maps and plans; and I only hope that he will be persuaded to lithograph his novel and beautiful sketches of the curious scenes which Pelagosa affords.

II. *Observations on Natural History at Pelagosa.*—Pelagosa, occupying a neutral tract between the Dalmatian and the Diomedean Archipelagos, is so little known to the reading world, that perhaps it will be advisable, before describing its antiquarian yields, to offer the results of our naturalists' four days' gleanings. The account must be short, as there are no books to borrow from; and the *mise-en-scène* may be interesting, because in many points the island is a new world upon a small scale; exceptional, and differing in climate, in geology, in flora, and perhaps in fauna, from all its Dalmatian neighbours.

The site, as has been shown, is in the heart of the Temperates (N. lat.  $42^{\circ} 23' 44''$ ). The distance from Lissa Port is 40 direct geographical \* miles, and 37—38 from the nearest south-western point;  $29\frac{1}{2}$  miles part it from the Italian coast (Viesti, on the Garganian promontory); 37 from the Tremiti, or Diomedean Archipelago; and 62 from the mainland of Dalmatia, the Adriatic being about 80 miles broad on this parallel. The form resembles upon the map that of a monstrous fish, with the head to the west, inclining a few degrees northward, and a well-defined fluke or forked tail to the east, with a little southing. The point of caudal junction, called "Il Confin," is an ugly knifeboard of crumbling yellow rock, with a precipitous fall on either side. The area of the larger feature is 349,000 square yards, or 72.3 acres, or 53.75 Austrian "Jugeri Cadastrali;" the smaller is of 41,712 square miles, or 8.6 acres, or 6.5 "Jocks." The maximum length of Great Pelagosa, from E.S.E. to W.N.W. is 1390 mètres. The greatest breadth of the base is 270 mètres, diminishing to 93 at "Il Confin;" and the average height of the jagged crest is between 60 and 70, rising to above 100 at the Castello. The Scirocco, tyrant of these seas, has converted the whole southern face, except at the "Žalo," into a stiff and broken cliff-wall, with denticulated head, and face corroded, channelled, and tunnelled into a thousand different forms. The northern side, seldom troubled by the Bora, is a dorsum of comparatively gentle slope, becoming more inclined and rocky as it descends seaward, where the bare fawn-coloured Calcaire is blackened by the washings of the ever-restless sea. The upper parts are clad with shallow brown humus, scattered stones, and thin vegetation: the chocolate colour of the soil at once attracts

\* In Austria there are 15 *meilen* to the degree; the same is the case with the Germanic mile.

notice, after the red earth of Istria and Dalmatia. About the east end of the island, as is also the case in Little Pelagosa, there are caves, hollows, and fissures; and those opening with upper spiracles, when the waters expel the compressed air, produce confused and prolonged groans, like the moans of pain—lugubrious accompaniments to the rough weather of a storm-lashed wintry night.

The meteorology of the rock appears to be wholly exceptional, and I have ventured to suggest to my energetic friend, President Alber, the advisability of supplying the Lighthouse with instruments and forms for regular records. As we approach it the air of the Mediterranean appears to lose splendour, and the lively light is suddenly exchanged for an ashen hue, especially about the horizon. Too small to attract clouds, Pelagosa is, in popular language, a *Spartivento*, or “split-wind,” like the cape called Clear, in cloudy Ireland. You see the storms furiously raging a few miles off to right and left, and the rains deluging the Dalmatian and Apulian shores. You feel an absolute stillness, reminding you of the *πείρατα γαίης*:—

Τῇ περ ῥήιστῃ βιοτῇ πέλει ἀνθρώποισιν  
 Οὐ νικητὸς, οὐτ' ἄρ' χειλῶν πολλὸς οὔτε ποτ' ὄμβρος  
 Ἄλλ' αἰεὶ Ζεφύροιο λιγὺ πνέοντας ἀήτας  
 Ὡκεανὸς ἀνίστησιν ἀεα ψύχειν ἀνθρώπους.—Odys. iv. 563.

It is a surprise, after the cruel climate of Trieste, which—the reverse of California, whose winter is May, and whose summer is only June—combines the winter of Iceland with the summer of Bombay; whose Bora, the alternative of the wet and gloomy Scirocco, blows a hurricane worthy of Antillean Saint Thomas, overturning carts, and requiring ropes along the quay to prevent the inhabitants being blown into the sea; and whose only alternatives are the *Contraste*, when the north-easter and south-easter meet and fight for mastery, and the *Provenza*, when the weather hesitates which of the two courses to take. Hence the annual average of mortality rises to 40 per 1000, nearly doubling that of London.\* At Pelagosa the Bora does not tyrannise over the cold season; and the Scirocco, after blowing for a few hours, either falls off to the west, or becomes a gale (*fortuna*). During twenty-nine months only four or five showers fell, and the dew, as in the fabled Garden of Eden, does its nightly duty by the ground. Even in the hot season calms are rare, lasting only for a few days; and the island is ever fanned by some gentle breeze. It is a popular saying that nothing ever falls overboard; some gust catches your hat and carries it back to deck. The sick, transported from the coast, speedily recover, and hitherto the employes have not known what sickness is. Finally, lest eternal perfection should become hateful, the occasional thunderstorms are of terrible violence. The solitary rock seems to attract them, like the Oil Regions of the United States, where the tanks are so often struck and destroyed. I enclose a Memoir † and illustrations, by M. Hänisch, of a *Gewitter*, accompanied by a s.s.w. gale and diluvial rain, which broke over the island at P.M. 0° 45' on April 17, 1876. The “thunderbolts,” discharged with a terrible

\* I know only one city in Europe, Rotterdam, where this figure is exceeded. But the climate of Trieste is not the only factor in the sum: the others are the vile hard water charged with lime, and the state of the old town, which has literally no drains. The former evil can hardly be remedied: there is no soft water in the neighbourhood. The latter can be wholly changed by widening to double their breadth the *androne*, or *culs-de-sac*, and the close alleys which represent streets; by laying down sewers for the impurities which now fester in the houses; and by the general “abolition of rookeries”—the latter foul as the “condemned localities” of Birmingham.

† “Wirkungen eines Blitzschlages auf der Insel Pelagosa.” Estratto dal ‘Bollettino delle Scienze naturali,’ N. 2, Annata ii. (Trieste, 1876).

detonation amidst a sheet of violet-coloured flame, seem to have fallen in bunches, or gerbs. The platinum point of the lightning-rod, 116 mètres above sea-level, was fused for half of its total length (three centimètres), without, however, the rest of the conductor being damaged. A fragment from one of the stone steps was struck off, and the south-western angle of the two outer walls was bored through. We were shown an iron-bound deal box, upon which the fluid had described the most curious figures; whilst another, containing tow, was carbonised externally, but its inflammable store remained uninjured. A hammer and a hatchet showed the line of passage, especially at the edges, by fusion, which partly converted the straight lines into fusiform excrescences about the size of peas. More curious still, the lightning passed diagonally through some twenty cans of petroleum, placed at different intervals, and scattered the combustible contents without setting them on fire. Lastly, about 10 mètres from the latter place the "thunderbolt" had discharged itself into the live rock of silicious limestone, cutting a cleft half a mètre in depth. The whole of this channel was carbonised to a sooty black, as though a mine had been sprung.

During our stay at Pelagosa the weather was mostly gloomy, apparently threatening a storm, and the employés of the Lighthouse declared that the first flash of lightning would drive them to the *baracke* upon the lower platform. In April the first assistant, who was standing upon the lower step of the main door, was thrown to the ground, where he remained senseless, and unconscious of the loud detonation. After a few minutes he recovered, and felt a dull pain in the right arm, hip and foot, which, however, soon disappeared. Entering the building he found the wife of one of the light-watchers creeping on all-fours, and almost out of her mind with fright. She also soon recovered. The third assistant, who was in the ground-floor kitchen, near the petroleum-magazine, complained of a lancing pain in the big toe of his right foot; and a painter belonging to the house, though accustomed to the springing of mines, fled to the lower lodgings, and did not return home till compelled by hunger.

The geological formation of Pelagosa is peculiar and exceptional as its meteorology, differing from that of all its neighbours and of the coast; and showing within narrow limits an abnormal amount of convulsion. The Adriatic, trending north-west to south-east in a basin of nearly equal breadth, whose axis is subtended on either side by similar orographic systems, the Liburno-Dalmatian chain to the east, and the Apennines on the west; and thus forming a gulf unlike any other in the Mediterranean, is usually distributed into three basins. A line of rocks and shoals passes through the "Kajola," Pelagosa, Pianosa and the Tremiti Archipelago to the Promontory of Monte Gargano, whilst there is the deepest water to the north and south. Our island forms apparently part of a volcanic curve, possibly a circle, whose plutonism is hardly yet exhausted. To the north, Lissan Comisa shows diallagite, an augitic pyrogenous alliance, which probably enters into the formation of Busi Island, and in the former place it supports gypsum-beds, which suggest that the direct action of sulphurous vapours has converted the carbonate into sulphate of lime.\* To the E.N.E. is Meleda Island, whose detonations, especially those of 1823, 1824 and 1825, are now explained by volcanic causes; eastward is Ragusa, where a terrible earthquake in 1667 buried some 5000 of the inhabitants; the neighbouring islands are also subject to this phenomenon, and the calcareous highlands of Dalmatia when examined carefully will probably, like those of Syria, show many detached tracts of plutonism. To the south-west again are the Tremiti

\* In the Museo Civico of Trieste are three drawers full of fossils and geological specimens, in some of which this change may be noticed.

structures analogous with Pelagosa: here, on May 15th, 1816, an eruption which lasted only seven hours, threw up pumice stones and sulphurous lavas. The great centre of the movement may begin in the Apennines behind Gargano.

Dr. de Marchesetti\* is disposed to date the genesis of Pelagosa to the post-cretaceous epoch when the plutonic action of the Euganeans, the Emilia, Etruria and Latium, prolonged through the eocenic and miocenic periods, gave the Italian peninsula the configuration which still distinguishes it. According to him, the great depth of water around the rock would argue a sudden rise, like the impetuous emergence of the Liburno-Dalmatian ranges in the cretaceous epoch. This period, as its strata prove, was one of vehement dislocations, producing irregular fissures with extensive and profound disruption, and contrasting strongly with the gentle upheaval of the Apennines in the post-cretaceous age.†

The stratographical succession is readily observed in the many transverse sections of our island, which is utterly destitute of the granite, gneiss, tufa (volcanic) and lava which were freely reported to exist. The strike of all the strata is from north-east to south-west, and the dip varies from the almost horizontal to the quasi-perpendicular. The base, shown along the whole southern wall and in the north-western bight, is a fine-grained schist, blue, and variegated, yellow-greenish, and sometimes ochre-coloured, with oxides of iron; a marly clay, showing frequent fucoid impressions, and splitting into thin lamellar strata with signs of decomposition. In ascending order upon this formation, especially on the southern part of the island, rest beds of gypsum, granular in the lower, and fibrous in the higher part, the upper limit being undefined and passing insensibly into the overlying marlous beds. But the mass of the island is a calcareous breccia, a rock which suggests that the disturbing action, at the close of its existence, was sudden and powerful. The fragments of the once-continuous calcareous strata have been comminuted into every possible shape; and compacted by a tenacious dolomitic paste before the angles were blunted. This breccia, sufficiently hard to strike fire, contains a quantity of true silex: the colour is dark brown, and the crevices are filled with red clay; in places there is a partial crystallization or vitrification of the strata, which look as if revetted with obsidian. Nodules of volcanic retinite (retinasphalte) were found both in the breccia and in the nullipore limestones. The only fossil was an ammonite, whose septa had been obliterated, rendering the species undeterminable. We also collected fragments of blue sandstone like steatite, and of sandstone enclosed in banded limestone, the common effect of calcareous deposition. The breccia in the north-western bay is dyked with a line of yellow clay, like the "Cimento" of Pola.

In the central part of the island, the continuity of this breccia is interrupted by a large fissure trending east-west and presenting strata of different materials. These, beginning from below, are two beds of red schistose clay, dipping gently from south to north, and separated by a layer of greenish schist. They are overlaid by two strata, as usual, rich in fossils. The lower, varying from 1 to 2 metres in thickness, is an ochraceous conglomerate of Pleiocenic age, showing *Venus*, *Ostrea*, *Pecten*, and other mollusks, with nullipores. The upper,‡ measuring 2 to 5 metres, a granular limestone of

\* My companion read a valuable and highly applauded paper on Pelagosa before the Società di Scienze Naturali in Trieste (Nov. 6th, 1876), and it appeared in extenso in the 'Bollettino' of Jan.-Feb., 1877.

† Similar signs of a circular wave of elevation, probably beginning at Monte Gargano, are to be found in the stratification of Pasman and Zuri Islands, near Sebenico, but the distance is too great to connect these with Pelagosa.

‡ Not the lower, as asserted by Dr. G. Stache, "Geologische Notizen über die Insel Pelagosa," p. 125, 'Verhandlung der k. k. geolog. Reichsanstalt,' 1876.

chalky and tufaceous aspect, and containing mostly helix, outcrops upon the surface, and we shall trace it from the *Cava* or quarry to the very base of the Castello. This upper mineral, evidently much more modern than the other, must be referred to the diluvial epoch.

The breccia which composes the *charpente* of the island culminates in the Castello, where it becomes darker, more flinty, and more homogeneous. The two lower courses of the lighthouse are built of this refractory material, which blunted the tools, and which proved so expensive that the contractor preferred importing his limestone from "Spljet" (Brazza), the quarry used for Diocletian's palace at Spalato. About the juncture of the first and second ramps of the short zigzag the breccia is traversed by a vein of the loose Eocene sandstone called, in Istria, *Tasello*, *Masegno*, and *Crostello*. Near the apex the breccia becomes more porous, and it supplies the island with what little soil it has.

Botanically considered, also, we are here in a small new world, of which, as yet, no satisfactory examination has been made. The first Commission, composed of the Councillor Muzio de Tommasini, Professor von Syrski, formerly custos of the City Museum, and Sig. Michele Stossich,\* reached the island on September 23rd, 1875. Dr. de Marchesetti's visit was in September 26-29, 1876. Thus the favourable season was missed on both occasions; and only dilettanti have made collections during the most propitious times.

Briefly to sketch the broad features of the Pelagosan flora. There is an absolute want of the trees and gregarious shrubs of the Dalmatian and the Diomedean islands: we look in vain for the ilices and junipers, the Illyrian oliveworts and arbuti (*unedo* = *corbezzolo*), the rock-roses or cisti, and the ericas, which form the greater part of the neighbouring vegetation. The area is confined, and the flora is not easily recruited from abroad; hence the predominance of the families best suited to the spot, and the small variety of forms. The rough and rocky soil also limits the extension of gregarious plants; and favours the diffusion of growths which, despising such hardships as, for instance, the spray that dashes over the Pharos-top, can climb the rock and thrive upon the scanty humus of its fissures. Moreover, characteristically poor in annuals, it is abnormally rich in bulbs, especially squills and wild garlic: † in places where the soil favours, they grow at the smallest possible intervals. A new species, discovered by my friend Cav. Tommasini, was named by him *Ornithogalum Visianii* (Tommasini), after the "illustrious Father of the Dalmatian Flora," and has been described by Dr. de Marchesetti (*loc. cit.*). On the other hand, the *Flora rupestre*, which presents a certain variety, is noteworthy for its alliance with the Dalmatian and Apulian growths. An adherent white tomentum mostly clothes the leaves, and two species are especially characterised by limited diffusion. These are (1) the *Centaurea Friderici*, of which more presently, and (2) the brassicaceous *Abyssum leucadeum*; the latter absent from Dalmatia, but abundant in the Tremiti and in the adjoining mainland of Japygia (Apulia).

It may be noted that the few trees are never allowed to survive babyhood. We found a fig rising to 6 feet on the southern shore, the true wild-olive (*Olea Europæa*), the vine run wild, and the bay (*Laurus nobilis*), especially in the hollow mouth of the Castello; while here and there flourished a solitary bush of blackberry (*Rubus amoenus*, rovo moretto, or moro spino), and a flexible *Dioscorea* (tamarro = *Tamus communis*). The growths which at once attract the eye are the *Absinthium* (*Artemisia arborescens*), congener of the Arab "shih," sweetest of desert herbs, which is conspicuous for its absence from the neigh-

\* Sig. Stossich published an "Excursione nell' Isola di Pelagosa," p. 217, 'Bollet. della Soc. Adriatica di Scienze Nat.' for 1875.

† The effects of eating the latter are notable, as in Tibet.

bouring archipelago; and the Capparis, with bloom as bright as the Passion-flower, a leaf metallic as the Ipomœa, and a root which will split even a Roman wall. There are also solitary bushes of *Ruta bracteosa*, *Coronilla emerus*, the malvaceous *Lavatera arborea*, the *Convolvulus cneorum*, the holly-like *Ruscus aculeatus*, the *Pistachia lentiscus* (rare), the *Euphorbia dendroides*, imitating dwarfed Chinese trees, and the wild kapuz (*Brassica Botteri*), bitter, but edible when new grown and well boiled. In the hollow north of the Pharos, well sheltered from the tyrannical scirocco, our botanists collected *Statice cancellata*, *Crithmum maritimum*, *Succeda fructifera*, *Olbia portulacoides*, and *Lotus cytisoides*. The frequent spray-showers have thickened the peduncles of *Picridium vulgare*, immediately under the flower; and the *Silene inflata*, condemned to live in crevices, has become gibbous with frequent knots and fleshy leaves, like one of the Crassulaceæ. As on the other islands, the *Centaurea Ragusina* lights up with its silvery leaves and golden flowers the dull and melancholy nakedness of the rock. The rich brown humus, which clothes the gentler slopes and comparatively riant tracts to the north, produces a tall asphodel with branches like candelabra, and yellow and rosy corollas: this is the Asâyet el-Rai (Shepherd's-staff) of the Libanus. Its *malefica radice*, like that of the arum, is or was (according to Fortis, II. 1, § 2) pounded into a farina, making the worst of bread, by the poor, who also support life by boiled juniper-berries. Here also were found the large-bulbed squills (*S. maritima*), *Papaver* (*setigerum*), the Piumino or *quianus (albus)*. On the more the *Matthiola (incana)*, a red crucifer locally and erroneously called "viola,"\* the eternal *Clypeola (maritima)*, whose white flowers even near Trieste last almost throughout the year, and a little green heliotrope (*H. Europœum*, var.?), which some would identify with the sunflower of Ovid.

The want of rain limits the variety and the growth of mosses; of these only two were noticed—a *Barbula* and a *Hypnum*. Less rare are the lichens, especially the common lithophils of Istria and Dalmatia, e.g. *Verrucaria purpurascens*, which lights up the rock; *Ramalina* and a *Rocella*, the latter abundant. The algaous vegetation, nullipores, sargassum, corallines, &c., is well developed, as the reader will find from Dr. de Marchesetti's catalogue.

Rabbits have been found on Little Pelagosa; none on the main feature, whose only mammals are imported rats and mice: at times a "sea-bear"† enters the baylet to the north-west. Migratory birds here rest for a few hours; and, during the season, often dash themselves against the Pharos: woodcock and quail are the most common. Of the residents we observe the sparrow-hawks, called Mangia-galline ("Hen Harriers"), hovering in the air; a few common gulls in the offing, and solitary stone-birds (*Monticola cyanea*?) and water-wagtails (*Motacilla*). Poultry apparently does not thrive, possibly because here, as in Iceland, the cereals are absent. The only important avi-fauna are the "Diomedean birds" (Strabo VI. 3, § 9), concerning which so many strange tales are told; Pliny (X. 44) calls them "Cataracta," a name still applied to the Skuas; and they are figured and described by Aldovrando (Historia, etc., Jour. III. pp. 57-62). But whilst Pliny makes his *Aves Diomedæ*‡ resemble coots, Ovid (Met. XIV. 498, 503) declares that, though not swans they are likest white swans; and thus narrates the fate which befel the companions of famous Diomedæ:

\* No true violet was observed.

† The common seal (*Phoca vitulina*), by the Slavs called Medved, and the Italians Orso di Mare: in Portuguese Madeira it becomes Lobo de Mar, or "sea-wolf."

‡ *Linnæus* poetically named "*Diomedæ exulans*," the albatross, a bird unknown to classical literature.

"Vox pariter, vocisque via est tenuata: comæque  
 In plumas abeunt: plumis nova colla teguntur,  
 Pectoraque, et tergum: majores brachia pennas  
 Accipiunt, cubitique leves sinuantur in alas.  
 Magna pedum digitos pars occupat: oraque cornu  
 Indurata rigent, finemque in acumine ponunt."

Stuffed specimens of this *Larus* (?)\* were shown to us; gull-like forms, with brown coats and bent bills. The Italians call them Gabbiani: the Slavs apply the term *Kaukale* (Ital. *Cocale*) to the larger kind and *Gregole* to the smaller bird. Their wailing cry is that of a child—*vagitus infantis similis*—and they are caught by swarming up the rocks at night with torches or limed poles, a dreadful trade, as is such birding everywhere.

The lighthouse employés produced spirit-specimens of a scorpion and a monstrous lizard with three tails: the original appendage had been supplied with a second which had bifurcated: they had also two snakes, one dark brown, the other lit up with greenish-white, and showing a triangular head, but no fangs. This lacertine coluber (*Cælopeltis insignitus*, Geoff.), which some have turned into a new species, *Cælopeltis Neumeyeri* (Verzeich. p. 57, Vienna Museum) is common in Dalmatia and Greece. The lizards, which are very numerous, are supposed to be of one species (*L. viridis*); but we noticed a second, apparently differing in colour and markings from the common green-yellow. There are sundry species of spiders, amongst which is a large *Lycosa*: centipedes, beetles, and grasshoppers are also numerous. The ground in places is covered with land-shells, especially *Helix*, *Clausilia*, *Pupa*, and *Bulimus*. M. Topich sent me a splendid specimen of a fossil univalve. M. Hänisch has collected a drawer full of "moulds"; mostly *Helix*. I have also seen the *Pectunculus (pelosus?)* of huge size, and splendid specimens of *Venus*. The fish require especial study: the staple article is the Sardine, whose mortal enemies, the shark and the dolphin, are never far off.

### PART III.—*Little Pelagosa.*

MM. Marchesetti and Stossich, intent upon collecting botanical specimens, took boat from the "Žalo," and visited Malo (Little) Pelagosa, the second largest feature of the miniature archipelago. This lumpy dome, lying to the east of the "Velika," well illustrates the luxuriance of local nomenclature. The Slav and other fishermen have given at least a hundred names to the whole group. The northern bay of the rocklet, for instance, is *Pod-molo* (for malo), "under the Little." To the south are the Bights of *Popina*, "the place of a Pope," and of *Luk*,† or wild garlic. East lies *Mevédina*, or "She-bear" (i.e. seal) "Bay;" and *Rasenj-rot*,‡ or *Punto Spiedo*, projects from the western flank. I cannot but suggest that "Bogaso Grande," opposite Spit-point, is the Turkish *Bugház*, a pass.

\* We neglected to borrow one, having been told that many were in the Museum of Trieste, which proved not to be the fact. It will be some time before this mistake can be repaired.

† *Luk* is evidently a congener of the German "Lauch," a relation to our "leek."

‡ Local mispronunciation for *Ražanja-rát*, or Roasting-spit Point.

The only sign of old human occupation noticed by the visitors was a vedette like that upon the Castello-flank. The oval of rude stones, some 6 mètres by 4, and strewn with sea-sand about 1 foot deep, crowned the central and highest part of the dome. Attached to its crest is a triangular offset of the usual *terriccio nero*, or dark malm, which may consist of animal and vegetable débris: fragments of pottery nowhere appeared.

The geology and botany of the rocklet were more interesting than the vedette. Whilst the line of outliers ranged to the west of Great Pelagosa appear in shape and substance, dip and strike, to prolong the main chine of limestone, those of the opposite flank present a notable contrast. Already in the eastern part of the rock appears a yellow-red marne, which splits into laminae with parallel faces, much resembling the *Argille scagliose* of the Emilia, which appears in Tuscany, and in other parts of Italy, but is nowhere known in Istria and Dalmatia. This formation is generally held, in Italy and elsewhere, to be the solidified remains of the *salse*, or boiling muds vomited by the Apennines at the end of the Cretaceous, and before the setting in of the Tertiary, period. The distinguished Professor G. Capellini, ex-Rector of the Bologna University, refers them to a process of metamorphism by means of gaseous exhalations and thermal springs. Their signs of vulcanism, the want of fossils and of regular stratification, the frequent hornito-like openings, as if caused by gaseous explosions, the broken surfaces, and their aspect of desolating sterility, are described by my illustrious friend, now unhappily no more, Professor G. G. Bianconi, in his '*Storia Naturale dei Terreni Aridenti*.'

This characteristic marne is still better developed in the rocks off Little Pelagosa, and renders the section of the latter very interesting. The dorsum which culminates to some 50 mètres is composed of the calcareous breccia which characterises the whole group; whilst a fissure, varying in breadth from 30 to 40 mètres, and splitting the dome from south-east to north-west, is filled with the porous and tufaceous, the uniform and pultaceous mass, of rosy tinge, containing a quantity of comminuted flints and limestone flakes. The parts richest in silice, and where its fragments are of the largest size, are those resting immediately upon the calcaire: from the centre of the rocklet, where is the greatest depression in the fissure, these débris are almost absent.

Despite the name Luk, plants were comparatively rare on Little Pelagosa, which showed only a modicum of wild garlic. The rocklet, on the other hand, can boast of two species which ~~are distinctly its own~~; and the marvel is that they never sought a home on its congenial soil by crossing the few yards of sea



separating them from the main formation. The first is the *Centaurea Friderici*, discovered by Professor Botteri, and named, by Professor Visiani of Padua, after the late Frederick Augustus, the botany-loving King of Saxony. It resembles the *Centaurea Diomedea* of the Tremiti, discovered by Professor Gasparrini. It is said to be found upon the almost inaccessible Pomo (Jabuka) Rock; and its leaves, like other congeners of the Gentian subclass, suggest a superior tonic "bitter." Again the *Anthyllis barba-Jovis* is found upon the Little but not on the Great Pelagosa; and *Convolvulus cneorum*, so common in the former, appeared only in one spot of the latter.

After four days of pleasant retreat beyond wars and rumours of wars, we left the lighthouse with cordial thanks to our hospitable and attentive hosts, M. M. Topich. The only serious fault of our second visit to Lissa was its short duration; and here we bade a temporary adieu to our friends, with a "Hip, hip, hurrah" à l'Anglaise, that seemed to revive the memories of more stirring times. The good ship *La Pelagosa* got up steam on September 27, and in twenty-four hours we had covered the 220 miles separating Lissa from Trieste.

III.—*An Account of the Country traversed by the Second Column of the Tal—Cho'tia'li Field Force in the Spring of 1879.* By Lieut. R. C. TEMPLE, F.R.G.S., M.R.A.S., &c., Bengal Staff Corps; lately attached to the 1st Goorkha Light Infantry.

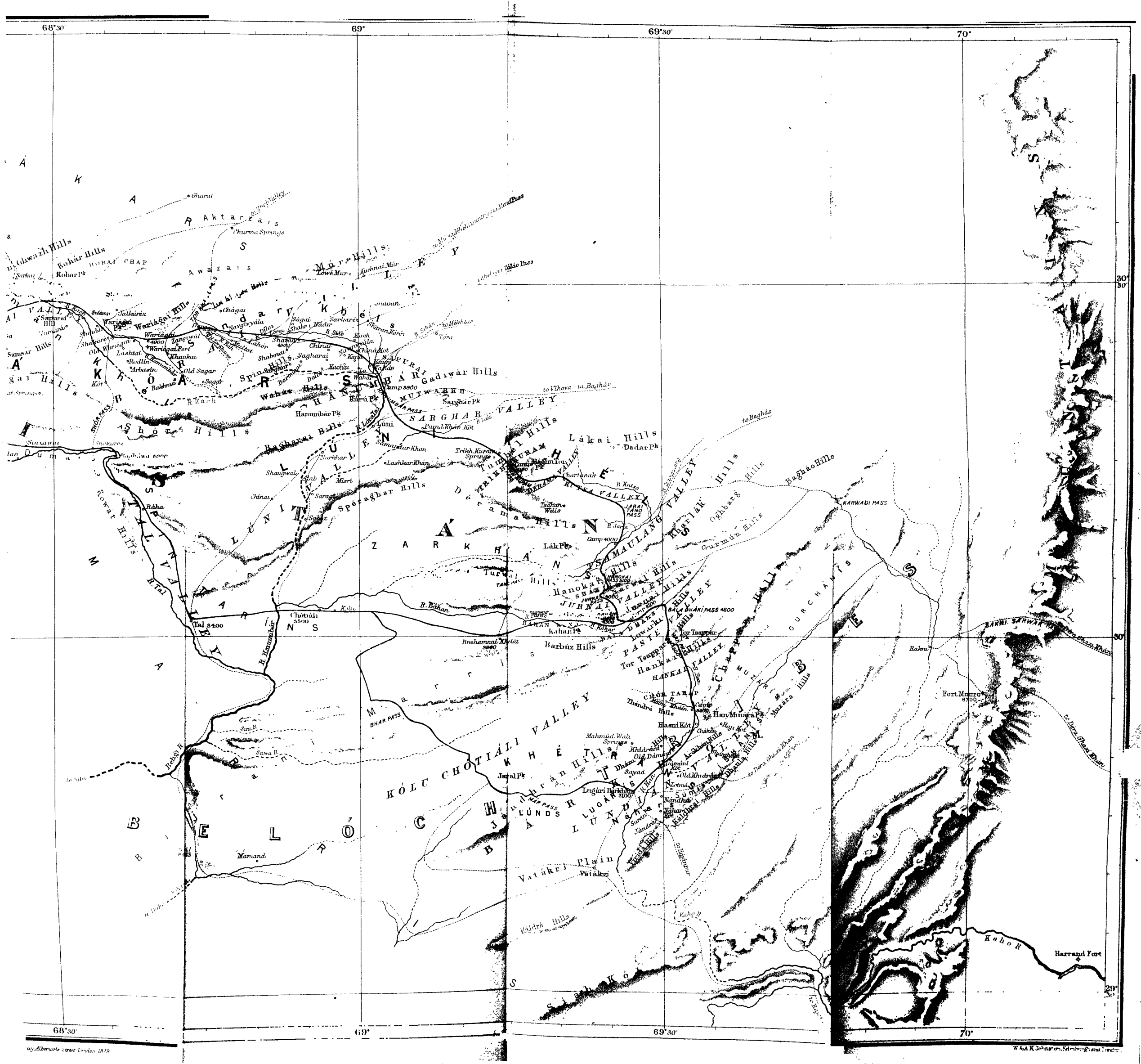
[WITH MAP.]

I.—INTRODUCTORY.

*Scope of Observation.*—As by the rules of this Society the authors of papers are held solely responsible for their contents, the present writer thinks it advisable to make a statement of the circumstances under which the inquiries resulting in these notes were made. When General Biddulph was directed to return with his force from Candahar to India by the unknown Tal Cho'tia'li route, he divided it into three columns. The first under Major Keene, 1st Punjab Infantry, with Major Sandeman as political officer, preceded the remainder by some days, and eventually reached Luga'ri' Ba'rkha'n *via* Tal and Cho'tia'li through the Han Pass; Major Sandeman and his personal escort, however, went through the Ma'r Pass more to the westward. The second column, under Col. Sale Hill, 1st Goorkhas, with Col. Browne, R.E., as political officer, which General







Biddulph himself accompanied, followed the steps of the first as far as Baia'nai, and then diverged eastwards along the Bo'rai Valley, and finally reached Luga'ri Ba'rkha'n *via* the Tsamaulang Valley and Han Pass. The third column, under Brigadier-General Nuttall, came last, following the route of the first all the way. The author, being at that time attached to the 1st Goorkhas, was with the second column, and as he has since had no opportunity of obtaining information regarding the doings of the first and third, his notes are necessarily limited to what he could observe during the march of the second column, and to such information as he could pick up *en route* about the country round.

Secondly, he could not in any way make arrangements for elaborate observations, and those embodied in these notes were made at such odd times as he could spare from his military duties, which, of course, on the line of march in an enemy's country, were incessant. His observations and sketch-maps, therefore, being perforce hurriedly and roughly made and compiled, must be taken for what they may hereafter prove to be worth.

*Place Names.*—As regards place names special difficulties were encountered, from the multiplicity of names certain places were found to have, and the great variety of pronunciations of the same word. The name adopted for any given place by the writer in his account and maps is that which he found to be the most generally known according to the commonest pronunciation, and the spelling adopted represents the name as it appeared to sound to him.\* The Pathan system of village nomenclature, and for that matter the Belo'ch also, is primitive in the extreme, for a village is called as frequently by its owner's, or by the tribal names of its inhabitants, as by its own. But this system, though primitive and natural enough to its framers, is far from being simple, and to the foreigner is peculiarly puzzling, for a village may be, and often is, called by six different names. Thus it may be called (1) by its own name, (2) by the tribal name of its inhabitants, (3) after the subsection of the tribe inhabiting it, (4) by the name of the district in which it is situated, (5) by its present owner's name, (6) by its late owner's name, if recently dead; the more specific names being naturally known only to those best acquainted with the village in question. And when to this confusion of names is added a great variety of pronunciation, the difficulty of ascertaining the proper name of any particular place may be imagined—a difficulty increased by the fact of these names never being committed to paper by their users. It is to this confused

\* The place names are more fully discussed in the Paper by the author on the inhabitants of these districts, published in the 'Journal of the Asiatic Society of Bengal,' for 1880.

nomenclature that the various names found on maps and in accounts by different writers for the same place is attributable.

Along the border between the Afghan and Belo'ch tribes double names are found, Afghan and Belo'ch, for well-known places. Thus Ka'li' Chuppri' (Belo'ch) and Tor Tsappar (Pathan) are names for the same prominent peak at the head of the Han Pass, both signifying the Black Hill.

A noticeable point also is the constant recurrence of the same names, especially for districts and hills, in different parts of the country. This is probably due to the fact of the places being so named from some peculiarity or special conformation.

*Uncertainty of Information.*—The difficulties of obtaining correct information were aggravated by the fear of the various tribes of each other, their ignorance corresponding with their fear. And this added to the well-known vagueness of all oriental information resulted in one's being seldom able to obtain any knowledge, except of the vaguest and most uncertain kind, of any part of the country before actually passing over it.

*Careless Nomenclature by Explorers.*—It may be as well to remark here on the careless way many explorers name the places and encampments at which they halt—a habit that renders the identification of places on their different routes very difficult, and their information liable to be useless, as will be seen by a reference to Appendix D, attached hereto. That it is not easy to avoid misnaming places in such a country as Afghanistan may be gathered from the foregoing paragraphs, but unquestionably carelessness as to this point adds much to the difficulties of geographers and others who have to compile the results of the accounts of travellers, or, in other words, to make them of use. A case in point is the naming by the Quartermaster-General's Department of the camping-ground preceding Chimja'n along the Tal—Cho'tia'li Field Force Route. This is given as Oboskoi in their map. Now O'bushtkai (also spelt Obuski by the staff) is where the first column halted, and is not within  $4\frac{1}{2}$  miles of the point so marked on the map, viz, where the second and third columns halted, which was really at a place called *Khwa'ra*, as shown in the writer's map. Again the Quartermaster-General's Department's map of the route shows Yusuf Kach in the River Ro'd Gorge as a camping-ground, and not I'sab Kach (or I'saf Kach), although it had been expressly pointed out by their own Department (Mackenzie's Route, in 'Central Asia,' Part II.; 'Afghanistan,' Route No. 35) that the name was I'sab Kach, *not* Yusuf Kach. The difference in these names may be better expressed in English: thus, I'sab, I'sav, or I'saf = Esau; Yu'suf = Joseph. Although the writer differs in several

important particulars from the Army Staff and other authorities in his nomenclature, he does not pretend to absolute correctness as to this point, but would merely put forth a claim to carefulness.\*

*The Tal—Cho'tia'li Route considered as a route.*—Attached to this (Appendix A) will be found a detailed journal of each day's march, and it is proposed here to discuss the Tal—Cho'tia'li Route only as a route. Now a route may be practicable or otherwise according to the nature of its roads, rivers, mountains, passes, climate, products, inhabitants, and means of locomotion. Each of these points will be here therefore considered.

## II. SPELLING OF PLACE NAMES.

*System of Spelling adopted.*—But before proceeding further, and in order to render the following pages the more intelligible, an explanation of the system of spelling the names of places and foreign words found herein will be given. The spelling adopted purports to be according to Dr. Hunter's modification of Sir W. Jones's system of transliteration. The Hunterian system is, however, not strictly carried out, the only diacritical marks used being that to mark the long vowels, and the "italic" sign to mark certain peculiarities in the consonants. The object aimed at is general intelligibility, not strict scientific spelling.

*Table of Sounds.*—The following table of vowel and consonantal sounds will aid the general reader in mastering the system of spelling herein employed.

### PART I.—Vowels.

Vowels.	Sounds.
a	As in woman, or as u, in hut.
a'	" father.
e	" met.
e'	" fête, or as a, in mate.
i	" fit.
i'	" oblique, or as ee, in meet.
o	" opaque.
o'	" mole.
u	" put, or as oo, in foot.
u'	" brute, or as oo, in food.
ai	" aisle, or as i, in mile.
au	As ou, in house, or as ow, in owl.
ö	As the French u, or German ö.

\* The points of difference are discussed in his Paper on the inhabitants of these districts, published in the 'Journal of the Asiatic Society of Bengal,' 1880.

Many of the vowel sounds are such as cannot be rendered in English characters. The common termination *ai* is very peculiar: it is pronounced with a closed mouth, and sharply as one syllable, though probably it should be two distinct syllables, *ái*. Many people write it *ae*.

Each vowel syllable should be pronounced, but for the sake of clearness the distinct syllables *ó* and *í*, when occurring as a termination in juxtaposition, are written *óí*.

PART II.—*Consonants.*

Consonants.	Sounds.
b	As in <i>boat</i> .
bh	" <i>clubhouse</i> .
ch	" <i>charger</i> .
d	" <i>doll</i> .
dh	" <i>mudhut</i> .
d } dh }	Very hard varieties of the above = the Hindost. $\bar{d}$ and $\delta\bar{d}$ .
f	As in <i>found</i> .
g	" <i>gun</i> .
gh	" <i>loghut</i> .
gh	A very guttural g = Arabic غ
h	As in <i>house</i> .
h	{ A sharp final aspirate, as in <i>Jehovah</i> , usually not heard in English pronunciation.
j	As in <i>jump</i> .
jh	" <i>bridgehead</i> .
k	" <i>king</i> .
kh	" <i>publichouse</i> .
kh	" German <i>milch</i> , or Scotch <i>loch</i> = Arabic ح
l	" <i>land</i> .
m	" <i>mind</i> .
n	" <i>now</i> .
n	Nasal, as in French <i>on</i> .
p	As in <i>pump</i> .
ph	" <i>pumphandle</i> .
qu	" <i>queen</i> .
r	" <i>robbery</i> ; it is always rolled.
r	A very hard cerebral r, almost a d = Hindost. $\bar{r}$ .
s	As in <i>sing</i> .
sh	" <i>show</i> .
t	" <i>tunnel</i> .
th	" <i>rathole</i> .
t } th }	Very hard varieties of the above = Hindost. $\bar{t}$ and $\bar{t}$ .
v	As in <i>very</i> .
w	" <i>wing</i> .
y	" <i>yard</i> .
z	" <i>zebra</i> .
zh	The French <i>j</i> , as in <i>je</i> = the Persian $\bar{j}$ .
ng	As in <i>fling</i> .



Double consonants all each distinctly pronounced as in the Italian *tutti*.

*Comparative Table of Hunterian and Phonetic Spelling.*—In order to aid in the identification of the names occurring here with those in other journals and maps, a comparative table is attached (Appendix C), showing the spelling of place names according to the Hunterian and the ordinary military phonetic systems. Accentuation has not been shown in the spelling, as not being of sufficient importance, and all oriental words used in the paper are explained.

### III. ROADS.

*Afghan Roads in general.*—Firstly, then, as regards roads. It is necessary before discussing them to explain what is meant by the term “road” when applied to Afghanistan. Roughly a “road” may be defined as a beaten track leading to a certain place; and, like all oriental tracks or roads, it runs as straight as possible to the point aimed at, without reference to gradients and obstacles, or to easier and more practicable lines near at hand. As the only means of locomotion, besides walking, which the Afghans have are horses, donkeys, and bullocks, to which may be added, along the main trade-routes, camels, no such thing as a wheeled conveyance being known in the country, a mountain road or track is capable of being, and indeed usually is, a very rough one. When asked to describe the nature of a track, the local mountaineer will describe it as practicable for sheep and goats and man only, or for donkeys and bullocks, or as too narrow in the case of a pass for pack-animals; under all of which conditions a road will be considered bad. But if a horse or pack-animal can traverse it, then the track is called good, or, to use the local expression, “a royal road.” Now, a reference to the map of Eastern Afghanistan will show it to consist of mountains of considerable height, intersected by numerous valleys of no great length or breadth, so that such a track as that above described, from any one distant point to another, will alternately cross a series of mountain tracts and valleys by the shortest practicable route. And in travelling what one finds practically is this, that one goes first along the bed of a mountain torrent, then over the (Kotal) pass or watershed whence it springs, then down a second stream-bed on the opposite side, and then along a valley; which operation is repeated to the journey's end. Such then is an Afghan road, and, as long as a horse or pack-animal can traverse it, one road is as good as another, and the only considerations which will make an Afghan guide diverge from the shortest

way are, (1) the fear of the inhabitants, and (2) the water-supply *en route*. A main road or line of communication differs in no way from any other "pack-animal" road, except that it usually consists of half-a-dozen or so of tracks running across country in parallel strings, but this is not always an infallible indication, as the writer once found to his cost. He started with a convoy from the Ka'bul gate of Candaha'r for Kela't-i-Ghilzai, and on getting clear of the broken land immediately round Candaha'r, went along a road consisting of a quantity of parallel tracks, which formed to all appearance the Ka'bul road, but found they terminated abruptly at a village about 5 miles out, between which and Candaha'r there was a large trade, and had to find the real Ka'bul road across country—which, by the way, provided there are no impracticable ravines to interrupt him, is about as good a way for the traveller to go in this country as any. When a traveller or army has followed any particular line, it means not that that was the best or easiest, though it was probably the shortest, road, but that it was the line decided on from time to time according to information received regarding water, people, supplies, the actual state of the track at the time, and so on.

*Roads along the Route of the Tal—Cho'tia'li Field Force (second column).*—Having said this much by way of preface, let us discuss the line followed by the second column Tal—Cho'tia'li Field Force with regard to its actual state and its capabilities of improvement. Leaving Kala Abdullah Kha'n, the road runs at first nearly eastwards, along the north end of the Pishin Valley to Khu'shdil Kha'n, for about 30 miles, during which, as it stands, it may generally be called bad in anything but fine weather, i. e., it is a track running across a country for the most part stony and water scarce, and intersected by several streams, of which the Khôjak, the Arambi, the Chôr, the Tôghai, the Muzarai, the Pishin Lo'ra, and the Barso' are all capable of proving formidable obstacles after rain. The country itself is liable to be violently flooded after rain in the hills, and in the lower lands the soil is clayey, heavy and slippery in wet weather. And yet the line taken by the force is the best, for the alternate routes from A'li'zai *viâ* Bagarzai to Khu'shdil Kha'n runs further from the hills, and the rivers, instead of being mere mountain-torrents with hard stony beds, have become formidable streams, with deep, overhanging, soft and clayey banks. There are, however, no real engineering difficulties along the route, nor would large bridges be required for the rivers; a good road could in fact be easily constructed. In the next 15 miles to Balozai Ka're'z the road goes over

the Surai Pass and the hills about it. During the first day's march to Sharan Ka're'z it follows up the bed of the River Sharan for the greater part of the way, which is as usual stony and hard, and not more than 20 yards wide in the narrowest part, while the gradient is steep. During the second day's march, till the bottom of the pass is reached, the bed of another stream is followed, the River Surai, similar in all respects to that of the Sharan, except that it is narrower, being only 4 yards wide at the narrowest part. The summit of the pass, whose height above the head of the stream is much greater than usual, is some 300 feet above the river-bed, and the hill-side is steep. When the summit is passed the descent is similar to the ascent, viz., down a stream-bed into the Dof Valley, along which the road runs for 4 miles to Balozai Ka're'z, crossing the River Surkha'b, which here is not a formidable stream in any way. This road, while among the hills and where not following the stream-beds, is rugged and hilly in the extreme, and plainly only passable in fine weather, a very short fall of rain rendering it temporarily impassable. A made road would of course not directly follow the line taken by the army, but should a road ever be required over the pass, it does not appear that the difficulties would be great, and probably not more than one bridge (over the River Surai,—Pishin side) would be required. The facts that Lieutenant Wells, R.E., made the pass easily practicable for camels in two days with the help of some Ghilzai workmen at eight days' notice, and that General Biddulph on the march up to Candaha'r passed down it without any made road at all, would indicate that no engineering difficulties need be apprehended here. After leaving Balozai Ka're'z the Dof Valley is quitted in 3 miles, and from this point to Khwa'ra in the Sho'r Valley, a distance of nearly 40 miles, a long belt of mountainous country, for the greater part at considerable elevations, is passed. Throughout this distance the road either runs along the beds of various streams, or over the hilly tracts separating them. It traverses three passes in its course, the Ush, the To'pobargh and the Nangalu'na, but none of these are of any difficulty. The main watershed of the country is passed on crossing the Ush Pass, *i. e.*, all the water to the east of it runs towards India and all to the west towards Afghanistan proper. The natural road along this mountain tract is nowhere difficult, and may be classed as fair throughout; but it should be borne in mind that for the greater part of the way it runs along the beds of rivers, some of which, especially the River Ro'd, are liable to sudden, high and violent floods in rainy weather, and are moreover of considerable length. There is

nothing apparently to prevent the easy construction of a good road along this line, nor would many even small bridges be necessary. So far the road has kept a nearly easterly course, but during the next tract of country traversed its course is about south-east, and during the journey from *Khwa'ra* to *Baia'nai*, about 29 miles, it runs mostly through flattish valley land, crossing the *Sho'r* and *Mzarai* Valleys. In the former it runs easily along stony ground, and the country in the latter is lumpy, much intersected by deep stream-beds and troublesome. The rivers crossed are the *Kach*, two or three times, and the *Ghwazh*, both of which, in the case of a made road, would have to be bridged, and the first is pretty broad. A road along the *Mzarai* Valley would also require a good many, and small, bridges and culverts, with a good deal of earthwork and cutting. The last 3 miles of the road into *Baia'nai* through the *Baia'nai* Pass are decidedly bad, running as it does over small hills or along narrow, rugged and stony valleys, intersected by numberless nullah-beds. It is doubtful, however, whether it would be necessary to go through this pass, for it is apparently easily turned to the east, past the villages of *Kach* and *Sarkai Zangal*, where the country is generally smoother and easier.\* The next belt of country passed by the force is all valley land to the *Hanumba'r* Pass, 50 miles; the road running nearly due east successively through the *Ghazgai* and *Bo'rai* Valleys, along which it is, for an Afghan road, good. There are no engineering difficulties in the way of constructing a made road, and the rivers to be crossed are the *Kach*, which is broad, the *Hanumba'r*, also pretty broad, the *Dargi'*, the *To'r Khaize*, the *Béh* and the *Lo'rai*, all small streams. But on nearing the *Hanumba'r* Pass, the meeting-point of all the drainage of the *Bo'rai* Valley, the country becomes rough, lumpy and liable to swamps, and the road along it is only a fair-weather one. The rivers to be crossed are the *Sia'b*, *Marai*, *Sihán* and *Lo'ralai*, all largish streams, showing signs of considerable flooding at times, and in making a road here there would, no doubt, be some troublesome ground encountered. From this point to the *Han* Pass, a distance of about 60 miles to the south-east, the country crossed is a mass of wild mountains intersected by narrow valleys, and quite uninhabited. In this tract the road, which winds about a great deal, is fairly good in the flat valley lands, but crosses several streams of the usual description, viz., the rivers *La'ki'*, *Kutsa*, *Jarai*, *Tsamaulang*,

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\* In fact the best route to follow from the *Sho'r* to the *Bo'rai* Valley would be apparently *Chimja'n* to *Kach*, 15 miles; *Kach* to *Ninga'nd*, 15 miles.

Hanokai, Ka'han and Han, and is bad and difficult in the mountainous country, following as before the beds of streams. It could, however, be made fairly passable with a few days' work anywhere, and there is nothing to prevent the construction of a good road if necessary, but of course some bridging would have to be done about the passes and over the rivers. The country in the Hanokai Pass is the most difficult, and the gradient in Han Pass is severe. The remainder of the road, which is in Ba'rkho'm, runs into Luga'ri Ba'rkha'n, 13 miles a little west of south, and presents no difficulties, running along a broad, flat valley.

The road then, as it stands, is, except in fair weather, for the most part bad, and difficult for anything but persons on foot or on animal-back, to coin a word, but does not anywhere present any engineering difficulties, and could be made fairly passable without much labour.

*Comparison with other Afghan roads.*—It should, however, be borne in mind that the above description will answer fairly for any road in Afghanistan, and that the road, for an Afghan one, is not bad. The line taken by the first and third columns of the Tal—Cho'tia'li Field Force will probably prove to be much the same kind of road.

*Table showing State of Roads.*—The following table will give an idea of the road stage by stage:—

From KALA ABDULLAH KHA'N to

No.	Stage.	Distance in Miles.	State of Road.
1	Badwa'n .. ..	6	Bad, except in fine weather.
2	A'li'zai .. ..	12½	Good in fine weather, but troublesome in bad.
3	Khu'shdil Kha'n .. ..	11	Bad, except in very fine dry weather.
4	Sharan Ka're'z .. ..	6½	As it is, bad, except in fine weather, but capable of being made good.
5	Balozai Ka're'z .. ..	8½	At present good in fair weather only, but capable of being easily made good.
6	I'saf Kach .. ..	9½	Good, but passes rivers liable to floods.
7	Ispira Ra'gha .. ..	16	Fair, but requires a guide, and runs along river liable to high floods.
8	Khwa'ra .. ..	13½	Fair.
9	Chimja'n .. ..	6½	Good and easy.
10	Baia'nai .. ..	22	In the Sho'r Valley easy; in the Mzarai Valley troublesome, with bad rivers; in the Baia'nai Pass bad and impracticable in any but fine weather.

## From KALA ABDULLAH KHA'N to

No.	Stage.	Distance in Miles.	State of Road.
11	Ninga'nd .. ..	9½	Good, but requires a guide.
12	Waria'gai .. ..	12½	Good.
13	Sharan .. ..	16	Good.
14	Hanumba'r Pass .. ..	12	Fair only in fine weather.
15	Trih Kuram Pass .. ..	18½	Good in Sarghar Valley, bad elsewhere, but capable of being made good.
16	Tsamaulang .. ..	16	Bad, but capable of being easily made good.
17	Ba'la Dha'ka .. ..	11	Very bad, but could be made easy in a few days.
18	Mitthi' Khu'i'n .. ..	16	Steep, but not very difficult, and capable of being easily made good.
19	Luga'ri' Ba'rkhā'n .. ..	12½	Good in dry weather, troublesome in wet, being along sun-dried, clayey soil.

*Excursions.*—During the march the author had three opportunities of making excursions off the main road, and the information gathered there supports the observations made above regarding roads.

The first excursion was from Balozai Ka're'z southwards to Gwa'l, 10 miles. Along this line the road was similar to the above-described valley roads, except that it was better than usual. It crossed the Gwa'l River, a variously named torrent of the usual description, two or three times. The second was from Gwa'l to Ukhmughdai Pass and A'madu'n, 15 miles; the object of these excursions being to see if the gorge of the River Ro'd could be turned to the southwards. The route runs through the Gurkhai Defile, i. e., along the bed of the river forming it, and may be there described as passable, but requiring engineering. As it is, it follows one bank or the other all through the defile and is hilly and broken, in places degenerating into a rocky mountain pathway, while the defile is not more than 50 yards wide in parts, and the river subject to high floods. After this to the Ukhmughdai Pass the road may be called fair and capable of being easily made good, but it winds about the River Sagar, crossing it constantly, and this stream is evidently quite capable of being an awkward torrent after rain. The country passed is exceptionally wild, consisting of small, conical, clay hills, among which the river winds with turnings so sharp and frequent, that it is impossible to see

beyond a few yards at a time. After the pass, as far as A'madu'n, the road is a lumpy, but an easy one. The road then, as a whole, is for a bridle-path fair, and is capable of being made a good one. It was found, however, to be not so good as the existing one *viâ* the River Ro'd.

The third excursion was undertaken from Chimja'n to ascertain the condition of the roads leading thence to the Zho'b Valley, and extended as far as the Pa'lkai Pass, north of Chimja'n, about 8 miles. The road was found to traverse some 20 miles of mountainous country separating the Sho'r and Zho'b Valleys, and, as usual, followed the bed of a river, the River Zaghlun. The country passed was very rough, but the road was, on the whole, fair. It is probable, however, that a more practicable line would be found along the Tarakai Valley, leading into the Zho'b more to the eastwards.

*Cross Roads.*—Before leaving the subject of roads it would be as well to discuss the alternative routes and cross roads passed en route.

*Quetta, Pishin and Candahar Routes.*—Numerous roads or rather tracks, of course, lead to all parts of the Pishin from Quetta, but the principal ones only need be considered here. From Quetta a road runs, *viâ* the Gazarband Pass, to Gulista'n Ka're'z, whence roads branch off to the Gwa'ja, Rogha'ni\* and Kho'jak Passes. This is a good road throughout for this part of the world. It is joined by a short cut from the Kho'jak Pass at Se'gai, which is also said to be an easy route. A second road from Quetta to Gulista'n Ka're'z runs *viâ* Khu'sh-la'k and Shadi'zai, joining the other at Se'gai, and turning the Gaz Hills. From Quetta also, *viâ* Khu'shla'k and No'a Ba'za'r, an easy road runs to Khu'shdil' Kha'n, which appears to have been an old main line of communication.

*Pishin to Zho'b Valley.*—From Khu'shdil' Kha'n, or from A'li'zai, *viâ* the Kha'nizai villages in the north-east corner of the Pishin, a road runs through the Amand Khe'l and Mehtarzai country, past Barsho'r and Mount Kand, into the Zho'b Valley. This is also a main line, but its nature was not precisely ascertained.

*Pishin to the Eastward into the Dof and Gwa'l Valleys.*—From No'a Ba'za'r an easy practicable road runs over the Pinakai Hills to Gwa'l, and there are also mountain-roads from the same place to Gwa'l *viâ* the River Surkha'b, and to Lu'r Anga'ng in the Dof Valley. Also from Sharan Ka're'z the

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\* The Rogha'ni is a seldom-used pass between the Gwa'ja and the Kho'jak Passes.

Surai Pass can be turned a short distance off by roads to north and south of it, respectively *viâ* Sa'ghai and Lu'r Anga'ng, both in the Dof Valley, but it does not appear that either route is preferable to that of the Surai Pass. And, lastly, there is a short cut from Barsho'r to Sharan Ka're'z over the mountains, probably by a bad road.

*Pishin to Ghazni and the To'ba Country.*—There is a road from A'li'zai over the To'ba country to Ghazni, but it was not described as a good one; and the To'ba country itself is probably to be reached *viâ* Arambi River or the Ma'chka River. These points, however were not clearly ascertained.

*Quetta viâ Gwa'l Valley to Zho'b Valley.*—A good easy road runs from Quetta *viâ* Khu'shla'k by the Gwa'l Valley, and thence through the Dof Valley past Balozai Ka're'z and the country about Mt. Kand into the Zho'b Valley, described as giving trouble nowhere; it also appears to have been an old line of communication. The Gwa'l Valley can also be reached by a doubtful road running east of Mt. Takatu through the Gurkhai defile. From this a road branches off from the Sagarband Pass, running to the Ukhmughdai Pass, and past A'madu'n to I'saf Kach, there joining the main line by the gorge of the River Ro'd to Tal and Cho'tia'li. This road is joined near Ro'dgai by a mountain-path running over the Dargai Hills from Balozai Ka're'z, *viâ* Shakar.

*Ukhmughdai Pass into the Marri Country.*—From Ukhmughdai Pass a road, the value of which was not clearly ascertained, runs past the village of Brahim'a'n and to the north of Mt. Zarghu'n into the Zhawar Valley, which is described as being a plain like the Pishin; a description that must be taken at a large discount. The road probably comes out in the neighbourhood of Si'bi, or at the Mazera'ni (Belo'ch) country to the north of it. It is also probably joined by a road which is pretty sure to run south from Ispira Ra'gha between Mts. Ma'zhwö and Spinskhar.

*Ispira Ragha to A'madu'n.*—When the writer was at Ispira Ra'gha a clearly defined track was seen to lead west from the camping-ground; but, as the neighbouring country is quite uninhabited, no information could be obtained about it. From the map, however, it would appear that such a track must lead towards A'madu'n.

*Mehtarzai Route viâ Mt. Sarghwand.*—An alternative route to that taken by the army lies from Mt. Kand, through the Mehtarzai country to the north of the Ro'd River, *viâ* Mt. Surghwand and the Ghobargai country, into the Sho'r Valley, coming out at Khwa'ra. The route is not described as bad, but it is not



usually employed on account of the bad character of the people about Mt. Surghwand. It is joined by a level road leading to the Pa'lkai Pass.

*Sho'r Valley to Zho'b Valley.*—From Chimja'n a road runs to the Zho'b Valley *viâ* the Zaghlū'n and Pa'lkai Passes, which has been already described, and two roads run through the Tarakai Valley; that *viâ* Khwai and Gundamarai is said to be good, and was the one by which Shah Jeha'n of Khasno'b (Zho'b Valley) came when he destroyed the food collected by Major Sandeman at Chimja'n; but that *viâ* the Ghwand Peak is only a mountain-path. The Tarakai Valley road is joined at Gundamarai by one from China'li in the Sho'r Valley. A road is also said to lead north-east directly up the Sungalu'n Valley to the Zho'b.

*Alternative Route viâ Kach and Sarkai Zangal.*—An alternative route to that taken from Chimja'n runs past Dargai, China'li, Kach, and Sarkai Zangal to Baia'nai; this would seem to be the better of the two. It appears from Lieut. Wells' reconnaissance that this was the route actually taken by a portion at least of the first and third columns of the force.

*Chimja'n to She'ri'n.*—With regard to minor roads a doubtful one runs from Chimja'n to She'ri'n, probably finding its way eventually into the Marri country.

*Khwa'ra to Gurmi'.*—From Khwa'ra to Gurmi' there is a road, which is most likely a local one, running towards the Baia'nai Pass.

*Baia'nai Pass Roads.*—There are two roads over the Baia'nai Pass; the one followed by the force, and another a little further to the south, past some springs called the Uchsaha'n Springs. There is little to choose between them; that taken is the most direct.

*To Zho'b Valley from the Ghazgai and Bo'rai Valleys.*—From Ninga'nd in the Ghazgai Valley two roads run to Ghurat in the Zho'b Valley, one *viâ* the Koha'r Pass, and one *viâ* the Bo'rai Chap; but little is known of them. And from the Bo'rai Valley, *viâ* the Tor Khaize' Pass, a road also runs into the Zho'b, but traverses an inhospitable country.

*Cross Roads connecting the Bo'rai Valley with the Tal and Ch'otia'li Routes.*—Connecting the Bo'rai and Tal Valleys a road from Ninga'nd runs past the Dargat Springs through the Ghobargai Hills to Sinza'wai: but there is said to be a difficulty about water along it. Also from Waria'gai there runs a practicable road through the Sho'r Pass to Bagha'wa. It was along these routes and through the Koha'r and Tor Khaize' Passes that Shah Jeha'n's men came from the Zho'b Valley, when they attempted to arrest the progress of the first column

at *Bagha'wa*. Lastly from the *Bo'rai Valley* a direct road runs through the *Lu'ni* country to *Tal*, *viâ* the *Hanumba'r Pass*.

*Roads to India from the Bo'rai Valley.*—With regard to roads to India, two roads lead directly east up the *Bo'rai Valley* to the *Mu'sa Khe'l* country, and thence eventually to *De'ra Gha'zi Kha'n* and *De'ra Isma'il Kha'n*, but are both said to be bad, and the temper of the inhabitants is said to be more than doubtful. A third road, also running directly east up the *Bo'rai Valley*, joins the main caravan (*Ka'fila*) trade-route from *De'ra Gha'zi Kha'n*, towards the *Zho'b Valley* at *Me'khtar*.

*Roads to the Bagha'o Valley, and thence to India viâ Viho'va.*—After the *Bo'rai Valley* and the *Hanumba'r Pass* are crossed, all the roads running eastward tend towards the *Bagha'o Valley* (Independent *Belo'ch* tribes), whence they eventually find their way to India *viâ* *Viho'va*, but none of them seem to be desirable routes.

*Roads towards Tal and Cho'tia'li.*—But all roads leading westwards go to *Tal* and *Cho'tia'li*. A rough undesirable mountain-road connects the *Tsamaulang Valley* with *Cho'tia'li*, while the main route to *Cho'tia'li* from the *Han Pass* runs along the *Ba'la Dha'ka Valley*, joining the route taken by the writer at the *Ka'han Peak*. Also a road, said to be impracticable for a force, joins *Lug'ari Ba'rka'n* with *Cho'tia'li viâ* the *Ma'r Pass*, but it should be remembered that Major Sandeman and his personal escort, including cavalry, traversed it without mishap.

#### IV. WATER-SUPPLY AND RIVERS.

*Water-Supply and Rivers.*—After the roads themselves, the water-supply and rivers along a route are the most important consideration. As might be expected in a mountainous country like Afghanistan, torrents, streams, and rivers are very numerous, but not large, and only the more important ones, of which the author ascertained the names, are shown on the map. None of those that are excluded have any water in them, except in wet weather, or after rain, and probably then only for a very short time. As a large portion of the route lies near the summit of the watersheds or catchment basins, much water is not to be expected in any of the streams, nor are many springs to be looked for.

*Permanent Streams.*—The only streams that were found to have a permanent supply of water were the *Kho'jak*, the *Arambi*, the *To'ghai*, the *Muzarai*, the *Pishin Lo'ra*, the *Barso'*, the *Surkha'b*, and the *Lo'ra*, in the *Pishin Valley*; the *Sur-*

*kha'b*, the Ro'd, and the Gurkhai, between the Pishin and the Sho'r Valleys, and in the Sho'r Valley only the Kach; in the Bo'rai Valley, towards the Hanumba'r Pass, the Kach, the Hanumba'r, the Sia'b, the Marai, the Siha'n, and the Lo'ralai. After leaving the Lo'ralai, the Kutsa, the Tsamaulung, and the Ka'han had water permanently only in deep pools, and no more permanently running water is seen till the Mitthi' Khu'in and the Han are met with to the south of the Han Pass. In none of the above streams is there any body of water, and only in the Lo'ra, the Lo'ralai, and the Siha'n is it more than ankle-deep, the rivers generally running about their beds in half-a-dozen dribbling streams. The river-beds are, however, extraordinarily large, even near the tops of the hills, and consist usually of water-worn pebbles and stones of even large size, showing that the streams are powerful torrents at times.

*Ku'ls, or Artificial Watercourses.*—There is a practice, especially in the more thickly-populated portions, of diverting streams along ku'ls,\* or artificial watercourses, for irrigation, which probably deprives the rivers of a good deal of their natural supply of water.

*Springs.*—There are not many natural springs outside the river-beds, nor is swampy land often seen in the valleys. The only springs passed *en route* were the Mzarai, near Baia'nai, and those near the camping-ground in the Trikh Kuram Pass. Others heard of were the Pla'n and the Uchsaha'n, near Baia'nai; the Dargat, between the Bo'rai and Lwa'ra Valleys, near Sinza'wai; the Churma, *en route* to Ghurat, from the Bo'rai Valley, and the Mahmu'd Wa'li, in the Ja'ndhra'n Range. These last are said to supply a quantity of good water.

*Wells and Ka're'zes.*—Wells and open reservoirs or tanks do not seem to be resorted to by the people in this part of the country as a means of procuring water. The only wells the writer could hear of were at a place called Tsa'han, in the De'rama Hills, some eight or ten miles east of the Trikh Kuram Pass. And the only tanks that came under his observation in Southern Afghanistan were in the Kadanei Valley, immediately west of the Kho'jak Pass, and one in the Pishin Valley, near

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\* A ku'l is an open artificial watercourse following the contour of the hills. It generally taps a mountain-stream at its head, but frequently also a river in some part of its course, and thence takes the water to any point where it is required. These ku'ls branch all over the valleys in the more civilised parts, and the stream or river-water is turned on from time to time to that portion of the land requiring irrigation. Some rivers, like the Tarnak near Candaha'r, are almost made to disappear in this way. Ku'ls are common all over the Himalayan districts in India, as well as in Afghanistan, and are sometimes carried for many miles. They are much valued, and have long since become a prolific source of litigation.

Sama'lzai, on the road to *Khu'shdil Kha'n*. *Ka're'zes*,\* however, are largely used in the Pishin Valley and the country round, and thence westwards all over Southern Afghanistan. A few are also to be seen in the *Kakar* country about the *Sho'r* and *Bo'rai* Valleys.

*Waterless Tracts*.—Of course about the summits of the watersheds waterless tracts are met with, extending over some distance; and here, as elsewhere in this portion of the Asian continent, the distances from water to water are often serious. These are naturally greatest in the mountainous parts of the route. From Shudand, in the upper *Ro'd Gorge*, there is no water till *Ispira Ra'gha* is reached, seven miles off, and even then the water-supply is precarious, so that one would have to be prepared to be without water as far as *O'bushtkai*, in the *Sho'r Valley*, distant from Shudand 16 miles. The *Sho'r Valley* itself is much more destitute of water than the valleys are usually found to be, none being met with between *Chimja'n* and the *Mzarai Springs*, 18 miles apart. But the main difficulty about water is encountered south of the *Hanumba'r Pass*, where there is no water after the *River Lo'ralai* is left till the *Trikk Kuram Springs* are reached, i.e. for 18 miles, and then no more till the *River Kutsa*, 11 miles, and not enough for a camp till the *Tsamaulung* camping-ground, 16 miles. From this to the *Ba'la Dha'ka* ground there is none for 10 miles, and after that none, except only a precarious supply half-way, till the *Han Pass* is crossed at *Mitthi' Khu'i'n*, 16 miles distant. Off the route the same thing is to be observed. There is practically no water between the *Sho'r* and *Zho'b* Valleys, *via* the *Pa'lkai Pass*, for 20 miles or so, and along the *A'madu'n* route no water was found at one point for 10 miles.

*Artificial Means of procuring Water*.—The above remarks apply only to natural sources of water-supply, for there are indications, such as damp soil, green and fresh overgrowth, &c., in many parts, of the near presence of water underneath,

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\* A *ka're'z* may be termed an underground *ku'l*, or artificial watercourse. The process of constructing one is apparently this: the course of the underground water-supply having been ascertained, a work requiring considerable skill and experience, wells are sunk along it at a short distance apart, and often to a great depth, and then connected below water-level by tunnels. The whole forms an underground artificial stream or *ku'l*, and is called a *ka're'z*. Its advantages are that the water-supply is tapped at its natural level, and a great underground cistern formed, not subject to the rapid evaporation it would undergo at the surface of the soil. *Ka're'z* digging appears to be an art confined to certain villages or families, and some sub-divisions of the *Ghilzais* are especially renowned as *ka're'z* diggers.

especially about the *Trikh Kuram* and *Han Passes*, and in several places now described as waterless. And it is probable that by judicious well-digging the country would be made to yield water at reasonable distances all along the route.

*Rainfall and Wet Seasons.*—There is a good deal of rain, sleet, and snow in the winter months, and some in the spring; but the regular rains appear to be about July and August, as is usual in this region. Very little rain, however, seems to fall south of the *Han Pass*, and what does fall comes about spring, and then only in showers. It is remarkable that not a drop of the water falling here and passing away in the numerous streams ever reaches the sea; that running away to the west is sucked up by the *Belo'ch Desert* to the south of *Afghanistan*, and that to the east by the *Kachi Desert*, or by the sandy wastes between the *Sulima'n Range* and the *Indus*.

*Quality of the Water-supply.*—As far as the palate can test, the water-supply is on the whole good and pleasant, but is said generally to contain salts in solution, and a considerable percentage of solid matter. In places it is brackish to the taste, as in the *Gurkhai River*; and in all the country between the *Trikh Kuram* and *Han Passes*, and some of the rivers, as the *Siha'n*, the *Lo'ralai* and the *Han*, have that peculiar pale green tinge betokening the presence of salts. In a few places, as along the *Sagar River*, and about the *Trikh Kuram* and *Hanokai Passes*, much of the water is salt and unwholesome.

## V. SUPPLIES.

*Nature of the Supplies.*—There is little to be got in the country beyond its natural products, food-grains, fruit and live-stock; and the only manufactured articles offered for sale were some rough woollen cloths here and there.\* The supplies may therefore be classed under the following heads: (1) food-grains and farinaceous food, (2) live-stock and animal food, (3) fruits, fresh or dried according to season.

*Crops and Food-Grains.*—First, then, as regards grains. The cultivation of these naturally depends on the water-supply, and, as a rule, where that is found to run short, food-supplies (and population) are also found to fail. Supplies are plentiful in the *Pishin* and up the *Ro'd River Gorge* as far as *I'saf Kach*, and again in the *Bo'rai Valley* and in *Ba'rkha'n* (*Bá'rkhóm*), but in the long mountainous belt between the *Bo'rai Valley* and

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\* Bread, however, was made at *Kala Abdullah Khán*, in the *Pishin*, and sugar and molasses were procured at *Sharan*, in the *Bo'rai Valley*.

Ba'rkha'n there are no supplies at all, and from the Dof Valley to the Bo'rai, all along the Ro'd River Gorge and the Sho'r Valley, they may be said to be scarce. So that a difficult road and a failing water-supply indicate a scarcity of food-supplies in this country. The crops grown are found to be much the same throughout, viz., wheat, barley, millet, and Indian corn (maize); to which may be added lucerne about the Pishin and as far as the Ro'd Gorge, and perhaps oats. In the Sho'r Valley such scanty crops as are raised appear to be barley and Indian corn. About Balozai Ka're'z and throughout the Dof Valley there is a noticeable cultivation of Manji't (madder), a plant producing a red dye. Locally it is said not to grow elsewhere, but it is to be seen about Candaha'r. It is grown in deeply furrowed land, at a considerable expense of time and trouble. Grass for horses, mules, and cattle was generally procurable without much trouble everywhere; and as grass, camelthorn, and southernwood were abundant in most places, the hill or Afghan camels had plenty to eat, but there was constant difficulty experienced in feeding the tamarisk-eating camel of the Indian plains. Of imported products tobacco, Indian and Kandaha'ri, was procurable everywhere, and also rice in a few places. Of grain, therefore, wheat, millet, Indian corn and barley, were generally obtainable, as also were flour, both from wheat and Indian corn, and Bhoosa,\* or chopped straw,† while rice was procurable in a few places only.

*Live-Stock and Animal Products.*—Of live-stock the chief are sheep, goats, and cattle, which are to be found everywhere, the bullocks being used chiefly for carrying purposes. Donkeys and horses† are procurable in the more populous parts, and camels in the Pishin and Ba'rkho'm. Fowls are to be bought everywhere, and in the Pishin the long-haired variety of the greyhound—known as the Persian greyhound—a very handsome, but somewhat treacherous and dangerous species. As common animal products may be mentioned milk, ghee (clarified butter), and eggs. Butter was procurable in the more civilized parts, but not easily; and butter-milk was only sold as such in one place, Sharan in the Bo'rai Valley. Meat

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\* Bhoosa, or chopped straw, is a common staple for cattle-food throughout Northern India and Afghanistan. During the late war the writer bought a bullock in the Arghisa'n Valley that took kindly to no other kind of food, showing that it was accustomed to subsist entirely on bhoosa.

† The so-called Ka'bulis, who sell horses all over India, are the Sayads of the Pishin, and consequently in their villages men are to be found in plenty who have travelled to all parts of the British Empire in the East, speak Hindostani fluently, and are thoroughly acquainted with English ways.

(killed) was not to be procured anywhere, and, in order to get meat, sheep and cattle had to be bought and then slaughtered. This, however, proved no drawback in a winter campaign, as the meat was all the better for being kept for a week or so. The only sort of meat that the writer saw offered for sale was some dried mutton in strips at Sharan, in the Bo'rai Valley. As animal products may be added cow-dung (go'bar), so universally used in India, but here, however, only on sale at Sharan; and dried curds (kurt), sold everywhere as a sweet-meat.

*Game and Wild Animals.*—As regards game and wild animals, but few opportunities presented themselves of ascertaining much. Partridges, hares, ravine deer,\* and pig were found *en route* at several points, while some snow-leopards were seen in the highlands about Ispira Ra'gha, in the neighbourhood of Mount Ma'zhwö, and porcupines' quills were found about the Trikh Kuram and Han Passes.

*Fruit.*—Round every village and hamlet, even in the wildest parts, are fruit-trees to be seen; in places, indeed, they are very numerous, and the main luxury of these mountaineers seems to lie in their fruits. In the winter they are sold in a dried state, and, with stewing, make excellent puddings and tarts. The chief are figs, plums, peaches, apricots, grapes (raisins), cherries, and olives. Pomegranates also are to be bought in the Bo'rai and Pishin Valleys. In Ba'rk-ho'm and the Belo'ch country the absence of the fruit-trees, to be remarked round every Pathan village, is immediately observable.

*Fuel.*—It has been remarked above, that wherever the road was difficult, and the water-supply failing, the population and food-supplies were also found to be scarce, but the converse holds good as regards fuel.† Wherever the population is scanty there the supply of fuel is most abundant, and the reason is not far to seek. The people hereabouts never seem to plant, or to care to preserve, any trees, except those that bear fruit,

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\* A very pretty baby specimen of what was supposed to be a ravine deer, caught in the Hanumba'r Pass, was handed over to the author to be taken care of. It was successfully brought to India as far as Dharmsa'la, when it suddenly died, seemingly of fever. It was unfortunately too young to be of much value as a zoological specimen, but from its skin it was supposed by Dr. Anderson, Superintendent of the Indian Museum, Calcutta, to be a variety of sheep, the *Ovis cycloceros*, which occurs in the Salt Range of the Punjab, Afghanistan, Beluchistan, and in Sind.

† Camel-dung is a common and effective substitute for wood as fuel. The dung of other animals may also be seen preserved in the villages for the same purpose.

and the process of procuring fuel and wood for building and similar purposes is simple. They cut down the nearest supply as required, and then proceed to the next. By this means the country has become gradually denuded of forest and wood—a process also observed in the Punjab, Mysore, and other parts of India—and hence that bare appearance noticed in such places by all travellers.

*Trees and Overgrowths.*—That the country is not naturally bare of forest and wood may be deduced from the fact that in places more difficult of approach than usual, as the highlands about Mount Ma'zhwö, and in the portions uninhabited for any reason, as the debatable lands about the Hanumba'r, Trikh Kuram, Hanokai and Han Passes, and in the Tsamaulang Valley, wood is by no means scarce; indeed, near the Hanumba'r Pass there is a small forest. It was to be observed, too, that wherever the land was hilly and difficult of access, though not very far from inhabited spots, such as the Kho'jak, Surai, and Baia'nai Passes, wood was to be obtained and trees to be seen growing, though not in any quantity. As might be expected, the vegetation and natural growths were found to be affected by locality and the very varying levels of the country. The most persistent overgrowths observed were southernwood and camelthorn, which are to be found apparently everywhere all through Central Asia, from the Sulima'n Range to the Caspian. The following were the trees and overgrowths seen in the various localities. In the Pishin Valley, as far as the upper gorge of the River Ro'd—altitude 5000 feet to 7000 feet—the trees were pistachio, dwarf tamarisk, berbery, cherry and olive; the overgrowths were southernwood, camelthorn, gentian, mosses of sorts, grass, both fine and coarse, reeds, dwarf holly, and a fragrant plant like broom, used by the natives as a medicine, and smoked like tobacco. In the higher lands at the Ush Pass, and about Mount Ma'zhwö—altitude, 7000 feet to 9000 feet—the trees were wild plum (bér), juniper, conifers of sorts, probably cedars and cypresses, and a bush like a rose; the overgrowths were camelthorn, southernwood, grass, fine and coarse, reeds, and the broom-like plant above mentioned. In the Sho'r and Bo'rai Valleys—altitude, 7000 feet to 4000 feet—the trees were berbery, olive, dwarf tamarisk, and in the lower lands tamarisk and willow; the overgrowths were southernwood, camelthorn, grass, fine, coarse, and tufty, du'b grass (*Cynodor dactylon*), dandelions, and reeds. In the country lying between the Hanumba'r and the Han Passes—altitude, 4000 feet to 5000 feet—the trees were tamarisk, dwarf tama-



risk, berbery, bér (wild plum, *Zizyphus jujuba*), babu'l (*Acacia arabica*), and dwarf palms; the overgrowths were grass, thick and fine, and also rank, reedy, and coarse, reeds, camelthorn, and southernwood. But in Ba'rkho'm, where the general altitude is about 3500 feet, there was seen to be a great change in the overgrowths, which now became similar to those observable anywhere in Beluchistan and the Indian plains about the Indus Valley. Grass and tamarisks were very abundant in the lower and damper lands.

*Distances without Supplies.*—As the distances between places, where supplies can be procured, are a serious consideration in such a country as this, a statement of them will be here given. There is no difficulty about supplies till I'saf Kach is reached on the River Ro'd, but there are none whatever from this to Chimja'n, a distance of 35 miles, or three days' march. And again there are none between Chimja'n and Ninga'nd, a distance of 30 miles, or two days' march. Such, too, as are procurable at Chimja'n are doubtful, so that one should be prepared to meet with scanty supplies from I'saf Kach to Ninga'nd, i. e. for 65 miles, or five days' march. Again, from the Lu'ni Valley to Ba'rkho'm, 60 miles, or five days' march, there are no supplies to be got of any sort. Troops and travellers, therefore, according to the direction of their march, should lay in a stock of provisions for five days at I'saf Kach and in the Bo'rai Valley, or in Ba'rkho'm and the Bo'rai Valley.

*Table showing Supplies procurable at Encamping Grounds.*—The following table will show in detail the supplies procured at the various encampments *en route*. It was, of course, impossible to ascertain the rates current in ordinary years, and the exorbitant prices demanded from the army were paid probably with a view to conciliating the inhabitants and keeping them quiet, they being encouraged in their demands by the political authorities, whose rates, according to which the Commissariat Department and all officers were requested to purchase, were higher than the prices that the people themselves ever thought of asking:—

No.	Encampment.	Supplies.
1	Kala Abdulla'h Kha'n .. ..	Plentiful of all sorts.
2	Badwa'n .. ..	Plentiful.
3	A'li'zai .. ..	Plentiful.
4	Khu'shdil Kha'n .. ..	{ Plentiful of all sorts, and fuel also abundant.

No.	Encampment.	Supplies.
5	Sharan Ka're'z .. ..	Fair.
6	Balozai Ka're'z .. ..	Plentiful.
7	Ysaf Kach .. ..	Good.
8	Ispira Ra'gha .. ..	None; fuel abundant.
9	Khwa'ra .. ..	None.
10	Chimja'n .. ..	{ Fair, but limited as to choice; fuel scarce.
11	Baia'nai .. ..	Next to none.
12	Ninga'nd .. ..	Scarce.
13	Waria'gai .. ..	Abundant.
14	Sharan .. ..	Abundant of all sorts.
15	Hanumba'r Pass .. ..	None; fuel plentiful.
16	Trikk Kuram .. ..	Ditto. do.
17	Tsamaulang .. ..	Ditto. do.
18	Ba'la Dha'ka .. ..	Ditto. do.
19	Mitthi' Khu'i'n .. ..	None.
20	Luga'ri' Ba'rkha'n .. ..	Numerous.

## VI. INHABITANTS.

*Afghan and Belo'ch Tribes met with en route.*—It is not intended here to go deeply into the subject of Afghan and Belo'ch tribes and their infinite subdivisions;\* a short description only of those whose territories were passed *en route* will be given. The Afghan tribes met with along the line of march were the Dura'nis or Abda'lis,† the Tari'ns, the Ka'kars, the Lu'nis, and the Zarkha'ns.

*The Dura'nis or Abda'lis.*—The Dura'nis are represented by the Achakzais, inhabiting the Kho'jak Pass and the hills north-west of the Pishin, and by a village here and there in the Pishin, the inhabitants of which belong to the Po'palzais, lately the ruling clan in Afghanistan through its sub-section the Sadozais (better known by the spelling Sudosyes), and to the Ba'arakzais, the present ruling clan. The late ruler of the Pishin, Khu'shdil Kha'n, a near relative of the late and present Ameers, was a Ba'arakzai of the Mohammadzai (the present royal) sub-section. The sub-sections of the Achakzais in the Pishin are the Abdals, Habi'bzais, and Ka'kozais.

*The Tari'ns.*—The chief inhabitants of the Pishin are the Tor

\* A Paper, by the author, on the inhabitants of the country passed through by the second column Tal—Ch'otia'li Field Force, is published in the 'Journal of the Asiatic Society of Bengal' for 1880.

† The original name of the tribe was Abda'li; the name of Dura'ni dates from the time of Ahmad Kha'n Sadozai, the hero of Pa'nipat and conqueror of Lahore and Mu'ta'n, who took the title of Durr-i-Durra'n, the Pearl of Pearls, on ascending the Afghan throne.

Tari'ns, one of the two great divisions of the Tari'n tribe, which is divided into the Spin (or white) Tari'ns and the Tor (or black) Tari'ns. The former inhabit all the country about Tal and Cho'tia'li, and the latter the Pishin Valley. The following sections of the Tor Tari'ns were found in the Pishin Valley, —Batazais or Badozais, Kha'nizais, A'li'zais, Nu'rzais, Kula'zais, Mu'sizais, Haikalzais, Manzakais, Ma'likais, Ha'ru'ns, and Kama'lzais. The known sub-divisions of the Spin Tari'ns are the Sha'di'zais, Marpa'nis, Lasra'nis, and Adwa'nis.

*The Sayads of the Pishin.*—Occupying several villages in the Pishin, holding a high and influential position as a sacred class, and commanding respect from their wealth and superior commercial qualifications, are the Sayads. They are not Pathans, but are supposed to be of Arab descent; at any rate they claim to be of such. However, to all intents and purposes, they are Pathans, and have a strong national feeling with that race. They deal chiefly in horses, and as horse-dealers travel to all parts of India, understand Hindostani well as a rule, and are acquainted with the ways of more civilized lands. Isolated Sayad villages are found throughout the Pathan country, and even in Ba'rkho'm and among the Belo'ch tribes. They always, wherever they may happen to be, command the same respect, and are looked up to as a superior race. They are sub-divided in the Pishin in a way which shows their adoption of Pathan customs. Thus, into Gangalzais, Bagarzais, Ajabzais, Sha'di'zais, Brahamzais, Haidarzais, and Ya'singzais.

*The Ka'kars.*—The whole of the country lying between the Pishin Valley and the Bo'rai Valley, including the latter, is inhabited by the Ka'kars. They are divided into the Lo'we' (or Great) Ka'kars, and the Kuchnai (or Lesser) Ka'kars; the latter in a great measure recognizing the supremacy of the former. The country occupied by the Great Ka'kars, whose chief appears to be Sha'h Jeha'n of Khasno'b, is about the Zho'b Valley, and that passed by the army belongs to the Lesser Ka'kars.

The Lesser Ka'kars are divided into Sulima'n Khe'ls and Amand Khe'ls, occupying the land between the Dof and Pishin Valleys; Mehtarzais, found between the Zho'b Valley and the Ro'd River Gorge, and the Pa'nizais to the southward between the River Ro'd and Quetta, both these sections ranging as far as Mts. Ma'zhwö and Surghwand; I'sa' Khe'ls in the Gwa'l Valley as far as Khu'shla'k; Ba'zais, Shamozaïs, Surgaraïs and Malagais in the Dof and Gwa'l Valleys; Sara'ngzais in the River Ro'd Gorge; Zakhpel's in the Sho'r Valley; Dumars about Smalan and Bagha'wa; Utma'n Khe'ls in the Ghazgai Valley and in the west end of the Bo'rai; and Sandar Khe'ls in

the Bo'rai Valley. Among the sections of the Great Ka'kars are probably the *Khwaïda'dzais*, *Mursia'ngzais*, *Aktarzais* and *Awazais*, to which should be added perhaps the *Mehtarzais* and *Surgarais* above stated to be of the Lesser Ka'kars. With regard to the sub-sections of the above, the author had not much opportunity of making extended enquiries; but it would appear that the *Tragarais* may be referred to the *Sulima'n Khe'ls*; the *A'di'zais* to the *Pa'ni'zais*; the *Mula'zais* and *Ta'ra'ns* to the *Sara'ngzais*; *Amazais*, *Kanozais* and *Na'ozais* to the *Zakhpe'ls*; the *Ali'zais*, *Shabozais*, *Mu'rs*, *Dargais* and *Waha'rs* to the *Sandar Khe'ls*.

*The Lu'ni Khe'ls*.—To the south of the *Hanumba'r Pass*, and occupying all the country between that and the *Belo'ch* border, are the *Lu'ni Khe'ls*, called also commonly the *Lu'ni Pathans*. They are not Ka'kars, and claim to be of *Abda'li* descent, and call themselves *Dura'nis*, but are not included in any of the lists of the *Dura'ni* sections. It was not ascertained that they are sub-divided in any way.

*The Zarkha'ns*.—The *Zarkha'ns* occupy the hills to the west of the *Spin Tari'ns* about the *Hanokai Pass* and *Ba'la Dha'ka*. Little is known of them except that they are *Pathans*, and unfortunately for themselves they are next door neighbours to the *Marris*, who have nearly wiped them out as a separate clan by constant harrying.

*The Belo'ch Tribes*.—The subject of the *Belo'ch* tribes and their sub-divisions is almost as complicated as that of the *Afghans*, and it will be here sufficient merely to mention those that came under observation. Roughly speaking, the border (to the east of which lies the *Belo'ch* district of *Ba'rkho'm*, commonly called *Ba'rkhan*) runs along the hills of the *Ma'r Pass*, thence to the *Barbu'z Hills*, and then past the *Tor Tsappar Peak* (or *Kali' Chuppri'*, *Belo'ch* name) in the *Han Pass* to the *Bagha'o Valley*. *Ba'rkho'm* is the first inhabited district, and appears to belong to the *Khe'tra'ns*, sub-divided into *Khidra'ni's*, *Da'ma'ni's*, *Na'hars* and *Su'mi's*. Several, however, of the other tribes have property here, apparently using it as a summer residence on account of the heat experienced in their main property, which lies in the plain between the *Sulima'n range* and the *Indus*. These are the *Luga'ri's*, *I'sha'ni's*, *Muza'ri's*, *Gurcha'ni's*, and the *Lu'nds*. All the hill country from *Ba'rkho'm* and south of the *Pathan* border as far as the *Kachi' Desert* and the *Bugti' territory*, is occupied by the *Marris*, a tribe of robbers, who are a curse and a terror to all around them, *Belo'chis* and *Pathans*.

*Table of Afghan and Belo'ch Tribes found en route*.—A table of the *Afghan* and *Belo'ch* tribes above mentioned is here given, to bring their numerous sub-divisions into one view.

PART I.—AFGHAN TRIBES.

No.	Tribe.	No.	Division.	No.	Section.	No.	Sub-section.
I.	{Dura'ni or Abda'li.	1	Zi'rak.	1	Po'palzai.	1	Sadozai.
				2	Ba'rakzai.	1	Mohammadzai.
				3	Achakzai.	1 2 3	Abdal. Habi'bzai. Ka'kozai.
II.	Tari'n.	1	Tor Tari'n.	1	{Batazai or Ba- dozai.	1 2	Lu'r Kha'nizai. Dab Kha'nizai.
				2	Kha'nizai.		
				3	A'li'zai.		
				4	Nu'rzai.		
				5	Kula'zai.		
				6	Mu'sizai.		
				7	Se'gai.		
				8	Ma'likya'r.		
				9	Ma'ezai.		
				10	Haikalzai.		
				11	Manzakai.		
				12	Ma'likai.		
				13	Ha'ru'n.		
				14	Kama'lzai.		
III.	Ka'kar.	2	Spin Tari'n.	1	Sha'di'zai.		
				2	Marpa'ni.		
				3	Lasra'ni.		
				4	Adwa'ni.		
		1	Lo'w'e Ka'kar.	1	Kh'waida'dzai.		
				2	Mu'rsia'ngzai.		
				3	Aktarzai.		
				4	Awazai.		
				5	Mektarzai.		
				6	Surgarai.		
				1	Sulima'n Khe'l.	1	Tragarai.
				2	Ahmand Khe'l.		
				3	Mektarzai.		
				4	Pa'ni'zai.	1	A'di'zai.
5	Ba'zai.						
6	Shamozai.						
7	Surgarai.						
8	Malagai.						
9	I'sa' Khe'l.						
10	Sara'ngzai.	1	Mula'zai.				
IV. V.	Lu'ni Khe'l Zarkha'n.	2	Kuchnai Ka'kar.	11	Zakhpe'l.	2	Ta'ra'n.
						1	Amazai.
						2	Kanozai.
						3	Na'ozai.
				12	Dumar.		
				13	Utma'n Khe'l.		
				14	Sandar Khe'l.	1	A'li'zai.
						2	Shabozai.
						3	Mu'r.
						4	Dargai.
		5	Waha'r.				

## PART II.—SAYADS.

	Tribe.	No.	Sub-division.
	Sayad.	1	Gangalzai.
		2	Bagarzai.
		3	Ajabzai.
		4	Sha'di'zai.
		5	Brahamzai.
		6	Haidarzai.
		7	Ya'singzai.
		8	Urumzai.

## PART III.—BELO'CH TRIBES.

	No.	Tribe.	No.	Sub-division.
I.		Khe'tra'n.	1	Khidra'ni'.
			2	Da'ma'ni'.
			3	Na'har.
			4	Su'mi'.
II.		Luga'ri'.		
III.		I'sha'ni'.		
IV.		Gurcha'ni'.		
V.		Lu'nd.		
VI.		Marri.		
VII.		Muza'ri'.		

*System of Government in the Pishin and Dof Valleys.*—The Ameer's power used to extend as far as the Pishin and Dof Valleys, where *Khu'shdil Kha'n* of the royal house was governor, having under him Nu'r Mohammad *Kha'n*, a (Mohammadzai) Ba'rakzai, as Naib or lieutenant. It does not appear that *Khu'shdil Kha'n* or his family ever resided in the Pishin, so that the Naib was probably supreme. The seat of government was the fort known as *Khu'shdil Kha'n*, which is now turned into a commissariat warehouse (or godown) in charge of another Nu'r Mohammad *Kha'n*, a Belo'ch (Luga'ri'), who is also Na'zim or ruler of the Pishin under our Government.

*Government in Ya'ghista'n.*—From the Dof Valley eastwards to the Belo'ch frontier the Ameer never seems to have had any control, and this part of the country is locally known as Ya'ghista'n, or the Independent Land.\* This Ya'ghista'n includes

\* Ya'ghi' is usually taken to mean an outlaw or turbulent fellow beyond ordinary control, and is used in a bad sense. In the above term Ya'ghista'n, its signification, however, seems to be confined to mere independence, but it must be remembered that the Pathans of this district bear a very bad name among their fellow countrymen.

all the Ka'kar country, as well as that of the Lu'nis, the Zar-kha'ns and the Spin Tari'ns. The term Ka'karista'n is, of course, applied properly to the Ka'kar country, but it is also loosely used in much the same sense as Ya'ghista'n. Here the government seems to be on the patriarchal system. Every village has its chief or Malik, and every tribal sub-section its Malik also, but such men as appear to be chiefs of a tribe or section, such as Sha'h Jeha'n of the *Zho'b* Ka'kars, Gwarrat *Kha'n* of the Sandar *Khe'l* Ka'kars, Samandar *Kha'n* of the Lu'nis, seem to owe their position as much to the force of personal character as to descent. There is apparently no Sirda'r, or head, of the Ka'kars, Lu'nis and so on, recognised as such, as among the other Afghan tribes. All the Maliks are styled *Kha'n*.

*Internal Fights and Squabbles.*—Every Malik seems to rule supreme in his own sub-section or village, and fights his neighbours, on occasion, without reference to the rest of his tribe, while the tribes and sections again unite under their chief for the time being to harry one another. Strangely enough, this system seems to work well enough in places, as in the Bo'rai Valley, as far as a certain rough kind of prosperity goes, but there are many indications of a constant state of petty war. And this not only in Ya'ghista'n, but also in the Pishin, where a more settled government existed. Recent instances are the harrying, and final driving into British protection at Quetta, of the Malik Sayad Sa'lo (Urumzai), with all his villagers, by the Malik of Sayad Paind, his near neighbour in the Pishin; and the destruction of old Waria'gai in the Bo'rai Valley, resulting in the removal of the village to its present site, on account of some local squabble. And many more could be found all over the country.

*Hatred of each other shown by the Tribes.*—The utter hatred and distrust of each other exhibited by these tribes is a source of wonder to a foreigner: even sections of the same tribe are afraid of each other, and often there is a fear of a certain village shown by its neighbours. Kach, in the Sho'r Valley, is a village apparently much dreaded in the neighbourhood, while Ka'kars murder Tari'ns, and *vice versa*. As far as one could gather, no Tari'n will willingly visit the Ka'kar country, and no Ka'kar the Lu'ni territory. Isa' *Khe'l* Ka'kars were met with who dreaded their brethren the Pa'ni'zais, and Zakhpe'ls who feared the Dumars and Utma'n *Khe'ls*, though they were neighbours and fellow-tribesmen. The only persons who have a safe-conduct everywhere are the Sayads, and even with them there is a danger of being mistaken for a Pathan. In

the eyes of a Tari'n, an Achakzai or a Pishin Sayad, every Ka'kar is a cut-throat, a scoundrel and a thief, fit only for extermination. This character of the Ka'kars also naturally obtains among the Belochis about Quetta; and, as we have never previously seen anything of the Ka'kars and Lu'nis in their own territories, it would appear that the bad character they have borne with us is attributable to this. As far as the present writer could see, in their own country and away from the border, where every man's hand is against them, the Ka'kars are no worse than any other Pathans; in fact, in some places they are better off.

*Isolation from the Outer World.*—As a consequence of their independent attitude towards the government of the Ameer, the inhabitants of Ya'ghista'n have been confined to their own territories on the western frontier, while the presence of their natural enemies the Belochis along the east and south border has prevented them from penetrating beyond it, and consequently they have become quite isolated and shut out from communication with the outer world, and live entirely among themselves.

*The Independent Belo'ch Tribes.*—The Belo'ch territory passed through belongs to the independent Belo'ch tribes, each under its own Tumanda'r or chief, none of whom recognise the authority of the Kha'n of Khela't. Their method of government need not be here dilated on, as it is well known and understood from their proximity to ourselves. Suffice it to say that up in the highlands of Ba'rkho'm they seem to live much like their Pathan neighbours, always either fighting them or each other. Their internal quarrels are not necessarily tribal, but often extend no further than the villages immediately concerned; and the frequent occurrence of deserted villages or of those whose sites have been recently changed, points to a constant habit of petty war. But the pests of the country are the Marris. This tribe, which occupies perhaps a larger territory than any other, lives professedly by depredation. They have only one town or village, Ka'ban, and, like the Zakka Khe'ls of the Khyber, they dwell in caves, whence they sally forth to plunder and murder. They are a curse to all around them, Pathans and Belochis alike, and the sooner they are crushed and brought to reason the better for the country.

*Language.*—The language spoken among the Pathans met with *en route* is Pushto, the language of Afghanistan, in several dialects. These differ, as might be expected, considerably as to terminations, pronunciation, and minor grammatical



points from the Pushto of the Yu'sufzais and the dwellers in the north, i.e. from the dialects with which Europeans are familiar, but nowhere to such an extent as not to be readily intelligible. Hindustani, of a sort, is spoken by the Sayads in the Pishin, whose natural language is, however, Pushto, and by such Ka'kars as have travelled abroad. A few of these were met with in the Dof and Gwa'l Valleys, and about the Ro'd River.

Among the Belochis of Ba'rkho'm a sort of Hindustani (? Persian), with a strong admixture of Panja'bi' and Sindhi' expressions and words, seems to be the language current, as they do not apparently understand the Brahōi language. Their language is easily intelligible to any one speaking Hindustani, and they readily understand it when spoken in return.

*Historical Remains.*—As far as could be gathered from a hurried passage through the country, the historical remains are very few. In the Pishin there is, near Sama'lzai (not far from *Khu'shdil Kha'n*) a small artificial mound, with the remains of fortifications round it. It is built on the same principle as that at Quetta, and probably may be referred to the same date, but there is no local tradition regarding it. It is called *Spin Khila*, or the White Fort. No other historical remains were seen till the Bo'rai Valley was reached, where the traditions of Na'dir Sha'h's march by this route to India are still strong. There is also a ruined fort of considerable size in the centre of the valley, called *Shahr-i-Na'dir*, which, like the others, is built on an artificial mound. All over this valley, through the Hanumba'r Pass, and along the route taken by the force, pieces of pottery and of burnt bricks are found, of a manufacture not now known here. These the inhabitants unhesitatingly refer to Na'dir Sha'h, as indeed they do everything that is old; but it is quite possible that their presence is due to the former passage of caravans (ka'filas) this way.\* There is also a ruined fort called *Sharghala*, in Ba'rkho'm, said locally to be of a great age, which statement must be taken for what it is worth; and near *Luga'ri'* Ba'rkha'n is a ruined tomb, called *Su'ra'n*, of the same pattern and build as those of the Dura'ni monarchs at Mu'ltan'. It may with some certainty be referred to the time of Ahmad Sha'h, the first Dura'ni ruler.

*Numbers and Population.*—It is of course extremely difficult

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\* Specimens of this pottery were sent by the author to the Asiatic Society, Bengal, but the results of the investigation (if any) made regarding them have not yet been communicated to him.

to judge of the density of population in such a country as this, but guesses may be made on such data as we have. In the Pishin Valley some fifty-three villages were passed *en route*, and taking this number to represent about half that there are in the valley, and the population at 200 per village, which is probably a liberal allowance, the total population of the valley would be about 20,000. In the Dof Valley there are twenty-three villages, which, at 200 per village, would yield about 5000 inhabitants. Down the Gwa'l Valley, as far as *Khu'shla'k*, there are probably about fifteen such villages, yielding a population of 3000. From the Dof to the Bo'rai Valley the villages could not, on the average, contain more than 100 persons, which would give us a population of some 2000 about the River Ro'd, and of about 2000 more as far as the Bo'rai Valley. The villages in the Bo'rai Valley are larger, and contain, say, 200 persons each, at which computation the population of the Bo'rai Valley should be about 10,000, and there are probably some 10,000 more among the *Lu'ni Khe'ls*. So that the total numbers of Pathans along the route would be about 50,000, of which 20,000 are *Ka'kars*. These figures would give us, as a guess, the total number of *Ka'kars* to be about 50,000, and perhaps as many as 75,000.\* The country is, in fact, very sparsely populated, except in a few isolated valleys, in which, as may be seen from the map, the inhabitants are fairly dense.

In *Barkho'm* the population may be estimated at 10,000 or more.

*State of Civilization.*—The state of civilization of the several tribes varies considerably with the locality, and may be gauged by the state of the dwellings and the methods of cultivation in vogue. As might be expected, the valleys are the most civilized, the inhabitants of the mountains apparently living chiefly by grazing sheep and goats, and cultivating grain just sufficient for home consumption.

*Dwellings.*—The various kinds of dwellings met with are illustrated in the plate attached to another paper,† and it will be sufficient here to briefly explain their structure.

The huts in the Pishin Valley differ considerably from those in the country to the west of the *Kho'jak* Pass. There the familiar flat-topped and domed hut of the Southern Afghan is everywhere to be seen, but in the Pishin the roof is sloped. The Pishin huts are built of stones and mud, or of mud entirely, or sun-dried bricks. The roof is of thatch, supported

\* Col. Macgregor's 'Gazetteer' places them at 72,000. See Major Mackenzie's 'Routes in Afghanistan'—introductory notice on Afghanistan.

† 'Journal of the Asiatic Society of Bengal,' 1880.

by strong coarse wood-work, covered over with mud, and is the most valuable part of the structure, on account of the difficulty of procuring the beams; and when a village from any cause changes its position, the roofs are always carried away to be set up on the new site. These huts are very difficult to destroy, even by fire, and are, on the whole, more substantial and comfortable than those further west. The average dimensions are—side walls, 16 feet wide by 6 feet high; gabled ends, 10 feet high by 6 feet wide. The doors (usually only one) are about 5 feet high by 3 feet broad. There are no windows, but usually three small holes, about 5 feet from the ground in the gable-ends, supply their place.

The dwellings found in the Dof and Gwa'l valleys are very similar.

In the lower gorge of the River Ro'd we come upon a much rougher style of dwelling, though it is still substantial. It is irregular in shape, and the walls are of rough stones, built up without cement, on the top of which is a wall of mud. The roof is also very irregular in shape, and, as before, of thatch, plastered over with mud. There is generally one hole in the wall as an apology for a window. The general dimensions are—walls, 10 feet to 12 feet long; rough stone-work, about 3 feet high, and mud superstructure, 1 foot to 2 feet high; total height of wall, about 4 feet; that of the hut being about 10 feet to 11 feet. The door is 6 feet high by 3 feet broad, and usually stands out from the roof on the principle of a dormer window.

In the upper gorge of the River Ro'd the huts are the roughest met with during the march, being for the most part merely a thatch of leaves and brushwood, supported on poles meeting in the middle in the form of a cone or pyramid. Their usual height is about 10 feet, and their diameter at the base is also about 10 feet. There is a rough doorway, about 6 feet high by 3 feet broad.

The huts of the Sho'r Valley present very much the appearance of those in the lower Ro'd River Gorge, except that there is no mud-work between the roof and the rough stone-work of the wall, and there is no window or hole in the wall to represent one. The dimensions are—length, 12 feet; height of wall, 3 feet; total height of hut, 8 feet; door, 6 feet high by 3 feet wide.

On reaching the Ghazgai Valley and the territory of the Utma'n Khe'ls there is a considerable difference to be observed in the construction of the dwellings. These are now well-built structures of mud, every hut being fortified and having

a small look-out tower attached. The walls and towers are of mud, and the roof is sloped, and is of a similar structure to those observed in the Pishin Valley. The doors are very low, probably for reasons of safety, being not more than 3 feet in height; and round the top of the tower is a series of loopholes. Dimensions are—length of hut, 16 feet; height of wall, 4 feet; total height of hut, 8 feet; tower, if square, 12 feet high, on a 6-foot base; if circular, 6 feet in diameter; doors, 3 feet high by 3 feet broad.

In the Bo'rai Valley were to be seen (and the same applies to the Lu'ni Valley) the best dwellings the writer saw in the whole of Southern Afghanistan outside Candahar. They are no longer huts, but have become houses, with considerably varying dimensions. They are built entirely of mud, with flat roofs, from off which the water is carried by projecting spouts. They are generally fortified, and have towers attached, and usually only one door. The bulk of the houses, however, in the Bo'rai Valley are much larger than those above mentioned, and may be described as fortified structures of mud surrounded by a mud wall some 12 feet high, and covering sometimes nearly an acre of ground. They have usually several towers attached and one door. Within the outer wall are a quantity of fruit-trees, and the house probably contains a whole family. Generally also there is a low 3-foot mud-wall extending round the fields belonging to the house. Three or four of these houses often constitute a village.

*Houseless Tribes and Kizhdais.*—Some of the Ka'kars, as the Sulima'n Khe'ls and Amand Khe'ls, and some of the Pa'ni'zais and Zakhpe'ls, seem to have no fixed dwellings at all, but live in rough blanket-tents, which they shift about from place to place as the exigencies of grazing require. The Achakzais are also a tribe of this nomad description, though they own some substantial villages about the Pishin. In the Pishin, also, the villagers—for grazing purposes, and sometimes to avoid the summer heats—go out into camp. The black semi-permanent tents of the Achakzais and the inhabitants of the country round the Pishin are called "kizhdais" (and locally also "kile's" or "kire's"). A kizhdai is a structure of bent willow-rods or withies, covered over with black felt-like blankets, but sometimes the covering is of blackened matting. They are very warm in winter, and by opening out can be made cool and pleasant in summer. There is a space in the middle for sheep and goats, to protect them against the severe frosts of winter. The usual dimensions are—height, 4 feet; length, 12 feet; openings or doorways, 3 feet by 3 feet.

*Granaries, Food-Stores and Mills.*—Granaries, as such, exist only in the Bo'rai Valley, where their construction is noticeable. They are small circular mud-towers of peculiar build, raised on piles about 2 feet from the ground. The average dimensions are—height of piles, 2 feet to 3 feet; height of tower, 10 feet; diameter at top, 3 feet; at the bottom, 5 feet to 6 feet.\* Grain, as a rule, is stored in sacks, weighing 160 lbs. to 200 lbs. (2 to 2½ maunds), which are kept in the huts. These sacks are of strong, substantial home-make, and valued a good deal for themselves. Bhoosa (chopped straw) is stored in heaps covered over with mud, as are turnips, &c., in England. These heaps contain as much as 4 tons to 8 tons each (100 to 200 mds.), and concealed among the Bhoosa are often to be found stores of grain. Grain is also kept stored underground under the floors of houses, or in places known only to the owners, for safety's sake. The A'sya's, or water-mills, show considerable skill in construction. They are to be found along the line of a ku'l, or natural running stream, and are worked on the usual principles; but often, to give the water greater power, a portion of the stream will be banked up to some distance before it reaches the mill. The mill itself has its roof on a level with the banks of the stream, and in outward appearance is a small hut, of the same construction as those above described in the Pishin. In places, as at A'li'zai, in the Pishin, long lines of these a'sya's and embankments are to be seen along the same stream.

*Cultivation and Irrigation.*—Everywhere, as far as it goes, the cultivation of the Pathans is carried on with some skill. The system of irrigation by means of ku'ls and ka're'zes has been explained already; but in places, in addition to these, a careful and costly (as to labour) system of reclamation of river-lands by means of groins and embankments, is to be seen along the line of the River Ro'd, and also along the River Kach, in the Sho'r Valley. These groins are usually of rough stones, but are sometimes made of the trunks of trees. They are frequently turfed over, and have willows and small bushes growing on them. In one place, also in the Bo'rai Valley, a ku'l was observed to be carried under the stony bed of the River To'r Khaize' by a syphon, showing no mean skill in its construction. As regards the cultivation itself, the ploughing is of the same

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\* This gives a cubic measurement of some 85 cubic feet, and, taking grain as weighing a cwt. per 2½ cubic feet, would give a holding capacity of about 1½ ton (for about 50 maunds), yielding, say, 1½ ton of flour (a'tta'), i.e., about 33 maunds, or, in other words, enough for 5 persons for a calendar year at 1½ lb. (¾ scers) per diem, the usual ration allowed by Government for a native.

rough, scratchy character visible throughout the East, with a like primitive instrument, which is by no means always even of iron. But the sowing is careful, and in some places the lines of the crops are as regular as with us. The principle as to rotation of crops appears to be to let the land lie fallow for some time, so that a much larger portion of land appears to be under cultivation than is really so in any one year, and they never seem to cultivate more than suffices for their current necessities.

*The Belo'ch Territory.*—There is no difference whatever to be observed in the construction of the Belo'ch buildings in Ba'rkho'm, or in their method of cultivation, from that in the Kachi' Desert, or among the Belochis of our own territory, so nothing further need be said about them here.

*Fighting Power.*—As regards fighting power, the fight at Bagha'wa proved how entirely overrated were the Ka'kars in this respect. Practically unarmed, and utterly unacquainted with the power of modern weapons, they can hardly be looked upon as an enemy. A very small force of armed soldiers would suffice to keep the peace, and, beyond casual robbing, there would be nothing to fear from them were the country opened up for trade. That the people of this part of the country are easily cowed may be deduced from the fact of the voluntary submission and "coming in" of Sha'h Jeha'n after the fight at Bagha'wa,—a submission apparently brought about from pressure put on him by neighbouring chiefs, who feared for their own safety. It is not likely that the inhabitants generally would remain marauders for any length of time were a settled government instituted; they are, in fact, too well off for anything of the kind. In the mountains and passes, however, trouble might be expected from the Zarkha'ns, Dumars, Zakhpe'ls and Pa'ni'zais, but it should be remembered that the presence of a small force sufficed to keep those inveterate robbers the Marris absolutely quiet. The Belochis have no idea of obstructing British rule, and nothing need ever be feared from them.

## VII. CLIMATE AND ELEVATIONS.

*Altitudes.*—It is a question whether the route taken by the force would be always passable in winter, when the altitudes are taken into consideration. The following are the *estimated* heights of the encampment above mean sea-level:—

No.	Encampment.	Elevation in Feet.
1	Kala Abdullah Kha'n .. ..	5600
2	Badwa'n .. ..	5600
3	A'li'zai .. ..	5500
4	Khu'shdil Kha'n .. ..	5600
5	Sharan Ka're'z .. ..	6300
6	Balozai Ka're'z .. ..	6600
7	I'saf Kach .. ..	7400
8	Ispira Ra'gha .. ..	7800
9	Khwa'ra .. ..	7900
10	Chimja'n .. ..	7400
11	Baia'nai .. ..	6500
12	Ninga'nd .. ..	5700
13	Waria'gai .. ..	4900
14	Sharan .. ..	4300
15	Hanumba'r Pass .. ..	3800
16	Trikh Kuram Pass .. ..	4100
17	Tsamaulang .. ..	4000
18	Ba'la Dha'ka .. ..	4100
19	Mitthi' Khu'i'n .. ..	3800
20	Luga'ri' Ba'rka'n .. ..	3100

*Traffic probably impossible in ordinary Winters for 60 miles.*—Now the winter during which the late campaign was undertaken proved an exceptionally mild one, and all the heights were easily passable at any time, but the *Kho'jak* Pass, with a maximum altitude of 7500 feet, is said to be quite impassable for traffic in ordinary, let alone severe, winters; so that, arguing by analogy, all the country from Balozai Ka're'z to Ninga'nd, nearly sixty miles, must be calculated to be under snow for some time, and all the way more or less impracticable during winter.\* A difficulty which may be better appreciated by a consideration of the altitudes of the passes *en route*, which are estimated as follows:—

No.	Pass.†	Elevation in Feet.
1	<i>Surai</i> .. ..	7200
2	<i>Mo'sai</i> .. ..	7500
3	<i>Ush</i> .. ..	8200
4	<i>To'pobargh</i> .. ..	8400
5	<i>Nangalu'na</i> .. ..	8500
6	<i>Baia'nai</i> .. ..	6500
7	<i>Hanumba'r</i> .. ..	3800
8	<i>Trikh Kuram</i> .. ..	4100
9	<i>Hanokai</i> .. ..	5100
10	<i>Jurnai</i> .. ..	5000
11	<i>Ka'han</i> .. ..	4300
12	<i>Ba'la Dha'ki'</i> .. ..	4600
13	<i>Han</i> .. ..	4300

\* But it should be remembered that snow never lies long at Quetta, or in its valley, at an elevation of 5700 ft. to 6000 ft.

† The more important are printed in italics.

*No difficulty from Climate at other Seasons.*—During the bulk of the year, however, i.e., in spring, summer and autumn, no difficulties need be apprehended from climate, and with a made road there need be none from wet weather.

*Climate.*—From the list of various thermometric readings taken during the march to be found attached (Appendix B\*), it will be seen that the chief feature in the climate during the spring is the great variation between the day and night temperatures; but this is not so great as is to be observed in the plains along the Indus Valley during the cold weather months, and is characteristic of all this part of the Asian Continent. Otherwise, especially in the higher lands, the climate to a European may be described as pleasant, fresh and health-giving. It is, however, extremely hot in the daytime in the lower lands after the Sho'r Valley is passed, and in summer the climate in Ba'rkho'm is described as detestable, preferable only to that of the Belo'ch plains. But though it is said to be very hot in the Pishin and Quetta Valleys, i.e., at about 5800 feet, in the summer, the heat can never be oppressive there, and in the highlands above this elevation there can be no heat worth mentioning at any period of the year.

#### VIII. PRACTICABILITY OF THE ROUTE.

*Advantages and Disadvantages of the Route.*—By a recapitulation of what has been above written we find that, as regards the actual road, it is a good one for the country traversed, and that the route presents no engineering difficulties in the way of constructing a good made road.

(2). That the water-supply is not bad *en route*; the main difficulty lying in the long distances without water, which, however, can be partially remedied by artificial means not now used by the inhabitants.

(3). That the food-supplies for man and beast *en route* are enough to support life without difficulty, and of sufficiently frequent occurrence to prevent anxiety as to failure, never more than five days' supply in hand being anywhere requisite.

(4). That there is, however, a scarcity of fuel, but not a dearth of it.

(5). That the inhabitants *en route* would require to be kept in order by force if the route were opened up for trade, but that they are nowhere in themselves formidable.

(6). That the main objection to the route is in the elevation

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\* The readings were, however, necessarily taken in a very rough-and-ready manner.



of a great part of it to over 6000 feet above mean sea-level thereby rendering it likely to become impassable from snow in winter.

*Comparison with the Bola'n Pass Route.*—But, taking the Bola'n Pass route as at present used,\* that known as the Tal—Cho'tia'li seems to be the better in every respect. To reach the Bola'n, a long strip, over 100 miles, of detestable desert has to be passed, practically impassable for troops or bodies of men in the hot season, or in ordinary wet weather, and troublesome as regards water at any time; while to reach the Sulima'n Mountains there are barely 40 miles of the low land to be crossed. Again, as to food, there are no supplies to be procured in the Bola'n Pass—a march of at least six days—without previous storage, and there is also always a difficulty there as to fuel and fodder; while the road, as at present used, simply follows the bed of the Bola'n River, and is impassable accordingly for days together in wet weather. And lastly, as regards climate, the Bola'n Route has the advantage of being only at an elevation of some 6000 feet at its highest point Darwa'zu, but the terrors of the Dasht-i-Bé'daulat at its summit during bad weather in winter are too well known to need more than mere mention here.

*Considered as an Alternative Route to the Bola'n.*—As an alternative route to the Bola'n, both for military and commercial purposes, the Tal—Cho'tia'li would seem to be invaluable, especially as we intend to hold the Pishin, for then Quetta and the Pishin would no longer be dependent on the Bola'n Pass for communication with the outer world. The comparative distances to the Indus are: from Quetta *viâ* the Bola'n Pass to Sukkur about 250 miles, and to Mithanko't about 270 miles; from Quetta *viâ* Tal—Cho'tia'li to Mithanko't about 310 miles, and to De'ra Gha'zi Kha'n about 290 miles. So that for commercial reasons there is not much to choose as to distance between the routes; but the proximity of De'ra Gha'zi Kha'n to Mu'tla'n, now about to become an important military centre, gives additional value to the Tal—Cho'tia'li as an auxiliary route.

*The Zho'b Valley Route.*—According to all native authorities the easiest and best route to India is through the Zho'b Valley to De'ra Isma'il Kha'n, but the isolated position of De'ra Isma'il Kha'n, and its distance from all existing main lines of communication, makes this an almost useless line to us. Moreover,

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\* It is said, however, that General Phayre, of the Bombay Army, in charge of the communications along the Bola'n Pass, has discovered a line by which all the worst features of the present route can be avoided.

before it could be practically used, the Mahsu'd Wazi'ris would have to be crushed or civilized.

*Best Trade Routes viâ Tal and Cho'tia'li.*—Supposing the British Government to decide to make the Tal—Cho'tia'li a practicable route for trade,\* it would appear that the best line to take would be from Mithanko't and Ra'janpu'r, or from De'ra Gha'zi Kha'n and Vaddo'r, to Ba'rkho'm, and thence viâ the Han Pass to Cho'tia'li and Tal; or, if the Ma'r Pass turn out not to be so impracticable as reported, then viâ the Ma'r Pass to Cho'tia'li and Tal; thence through the Lu'ni Valley, thence viâ the Hanumba'r Pass through the Bo'rai Valley, thence through the Zho'b Valley, and finally viâ the skirts of Mt. Kand through the Dof and Gwa'l Valleys to Quetta; or viâ the skirts of Mt. Kand and Barsho'r to the Pishin Valley. A glance at the map will show that villages will lie thick along such a route, and that consequently better roads would be met with, and greater returns anticipated by the trader.

#### IX. MISCELLANEOUS OBSERVATIONS.

*Geographical Notes.*—Certain changes in our ideas as to the geography of this district will result from the march of the Tal—Cho'tia'li Field Force.

Firstly. The long range of mountains to the north of Quetta, the Bola'n and the Marri Hills, supposed to run east and west from the Sulima'n Range, does not exist. The direction of the mountains is generally north and south, in lines more or less parallel to the Sulima'n Range.

Secondly. The To'ba, Jo'ba or Yo'ba Peak, to be found on so many maps at the head of the Zho'b Valley, is most likely a myth or misnomer. Nothing approaching to such a name could be ascertained locally.

Thirdly. Mt. Kand is not nearly so far north as previously placed; while there are some doubts as to the existence of Mt. Chappar, at any rate, it is not a prominent mountain, as before supposed. It has been placed on the accompanying map, because a round-headed snow-capped mountain was repeatedly pointed out from the Pishin as Mt. Chappar. When, however, it came to be identified from a hill above I'saf Kach, which should have been in its neighbourhood, an apparently low hill

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\* The road once made, perhaps the most civilising agent we could employ in Afghanistan would be the use of carts and wheeled carriages. The manufacture of farthing dips was introduced with signal success into Candaha'r during the former war: why should not carts succeed as well?

in the right position was by some of the guides pointed out as Mt. Chappar, while others seemed doubtful of its existence.

And lastly, several prominent peaks have been for the first time named and placed.

As regards nomenclature the name Khojeh (or *Kho'ja*) Amra'n Range, is a misnomer. Ranges or lines of hills, as a rule, have no generic names in Afghanistan, the Afghan system of nomenclature not having yet reached that stage. But nearly every prominent or remarkable peak has a name of its own. In this case, *Khwa'ja* Amra'n is really the name of a point above the Gwa'ja Pass, and not that of the whole range. If any name belongs to the entire line of mountains it is *Rogha'ni*. However, as the name *Kho'ja* Amra'n has become popularised in geography, it would be a pity perhaps, as well as almost useless, to try and alter it.

The town Peshin also, mentioned by so many travellers, does not exist. They probably meant by the term the cluster of Sayad and Tari'n villages about Sayad Paid and A'li'zai in the Pishin Valley.

*Scenery and Landmarks.*—Looking eastwards from the Pishin, there is a grand and striking view of the series of mountain-ranges commencing from Mt. Chiltan on the south, and thence running past Mts. Takatu', Zarghu'n, Pi'l, and Chappar, to Mt. Kand on the north. Mt. Takatu' is a fine mountain from any point of view, as also is Mt. Ma'zhwō, of which a grand view is obtained from Shudand in the River Ro'd Gorge. Mt. Surghwand is likewise a fine and striking mountain from the north. There is also a very fine view from the Nangalu'na Pass over the Sho'r Valley and Ghobargai country, the Chimja'n Ghar Peak and Mt. Sya'jgai presenting a remarkable appearance, and there is a pretty view towards the She'rkai Peak and Koha'r Hills from Baia'nai. But with these exceptions the country is too bare and broken up into small points to be striking or pretty. Mt. Sya'jgai, an isolated square-topped peak, in the middle of the Sho'r Valley near Chimja'n, is here a remarkable object from all points; but it would not be so in India generally, where there are many like it in all parts of the country from Ra'jputa'na to Mysore.

*Heights of Mountains.*—Many of the mountains rise to a considerable elevation, but the heights stated in the accompanying list (page 230) were *guessed* at on the spot from such data as could be obtained.

*Geological Formations.\**—The geological formation of the

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\* A Paper by the author, on the geological formation of the country passed through by the Second Column Tal—Cho'tia'li Field Force, will be found in the 'Journal of the Asiatic Society of Bengal' for 1879.

No.	Mountain.	Approximate Elevation in Feet.
1	Takatu' .. .. .	11,500
2	Mangal .. .. .	9,000
3	Zarghu'n .. .. .	10,500
4	Pi'l .. .. .	9,000
5	Chappar .. .. .	8,500
6	Kand .. .. .	10,500
7	Ma'zhwō .. .. .	11,000
8	Surghwand .. .. .	10,500
9	Spinskhar .. .. .	10,000
10	Surlo' .. .. .	10,500
11	Matkhilar .. .. .	10,000
12	Sya'jgai .. .. .	9,000
13	Na'via't .. .. .	9,500

greater part of the country passed through should apparently be referred to the Tertiary period. Messrs. Medlicott and Feistmantel, of the Geological Survey of India, who kindly examined the geological specimens the writer collected, reported after a first cursory examination as follows:—

“The fossils are exclusively tertiary, none are post-tertiary. They are mostly nummulitic: possibly all of that age. The supposed lizard is a detached segment of an echinoderm. A very large proportion of the rocks are of such limestone, sandstone, and shale, as are usual in tertiary formations. There is no fragment of granitic or metamorphic rock, except one which is crystalline limestone, but this may be a contact rock. The same may be said of a few specimens of indurated silicious rock, which are of the type common at the contact of eruptive rock. Some of them are jaspitious. Of trappean rocks there are not a few; some are syenitic and dioritic (non-quartziferous), and some are earthy amygdaloids. The crystalline minerals are the commonest forms of quartz, calcspar and gypsum; one is clear, white, cubical rock-salt. There is no metalliferous rock or mineral in the whole collection” (600 specimens). When, however, the specimens shall have been referred to their proper geographical position a better idea of the geology of the country will be obtained.

*The Glacis.*—But the most remarkable point as to conformation to be noticed is the peculiar glacis, or slope up to the hills from the valleys. And at the risk of recapitulating what has been published by the writer elsewhere, a short description of this glacis will be here given. It is to be seen everywhere in Afghanistan proper, though not noticeable in Beluchistan or south of the Bola'n or Han Passes, and is said to be a common

feature throughout Persia and Central Asia. It is to be seen at the foot of every range of hills, varying in length and height according to the elevation of the neighbouring mountains above the valley-level. In the Kadanei Valley, where the Kho'ja Amra'n Range rises 3000 feet and more above the mean valley-level, it is 15 miles long, and nearly 1500 feet in height; while in the narrower valleys, such as the Gwa'l, the slopes on either side almost meet in the centre, leaving hardly any flat spaces at all. One result of this glaci's is that the valley-level seems to be reached long before it really is so. Its surface is generally much water-scoured, and is covered over with stony detritus from the mountains, and over it also wander the stony beds of numerous torrents. The origin of the phenomenon apparently lies in excessive denudation of the mountains, caused by the absence of forests on their slopes, and the soft, shaly nature of many of the summits, which last, again, probably arises from the combined action of frost, snow, and rain.

## APPENDIX A.

### ITINERARY from KALA ABDULLAH KHA'N.

No.	Stage.	Miles.	Total Miles.
1	Badwa'n .. .. .	6	..
2	A'li'zai .. .. .	12½	18½
3	Khu'shdil Kha'n .. .. .	11	29½
4	Sharan Ka're'z .. .. .	6½	36
5	Balozai Ka're'z .. .. .	8½	44½
	1st excursion to Gwa'l, 10 miles.		
	2nd excursion, Gwa'l to A'madu'n, 14½ miles.		
6	I'saf Kach .. .. .	9½	53½
7	Ispira Ra'gha .. .. .	16	69½
8	Khwa'ra .. .. .	13½	83½
9	Chimja'n .. .. .	6½	89½
	3rd excursion towards Zho'b Valley, 8 miles.		
10	Baia'nai .. .. .	22	111½
11	Ninga'nd .. .. .	9½	121½
12	Waria'gai .. .. .	12½	133½
13	Sharan .. .. .	16	149½
14	Hanumba'r Pass .. .. .	12	161½
15	Trikh Kuram Pass .. .. .	18½	180½
16	Tsamaulang .. .. .	16	196½
17	Ba'la Dha'ka .. .. .	11	207½
18	Mitthi Khu'i'n .. .. .	16	223½
19	Luga'ri' Ba'rkhan .. .. .	12½	235½

## FIRST STAGE.

*Kala Abdullah Kha'n to Badwa'n.* 6 miles. General forward bearing, 86°. 11th March.

Kala Abdullah *Kha'n*, 5600 feet, is a village at the entrance to the *Kho'jak* Pass from the Pishin side to s. of the pass. It is the residence of Mi'r Aslam *Kha'n*, Abda'li, the Sirda'r, or chief, of the Achakzai section of the Dura'nis. He is the son of the late Mi'r Abdullah *Kha'n*. The village is not large, say twenty houses, though it has the appearance of being so on account of the sera'i or fort Mi'r Aslam *Kha'n* has built by it. There are some trees and a garden in this upon which the Sirda'r has spent, he says, Rs. 2000. The arable land between the *Kho'jak* stream and the village is said to be a ja'gi'r and rent-free.

The crops grown hereabouts are wheat, barley, millet, Indian corn (maize), and lucerne.

Supplies are plentiful of all the sorts generally obtainable in Afghanistan, viz., bhoosa, barley, milk, butter, fowls, eggs, and I saw some cloths of European make also being sold. The supplies come from the district round, Habi'ullah, a large Achakzai village to s.e., furnishing a quantity under the influence of the Sirda'r, who had the farming of this part of the Pishin under the Ameer's Government.

There is a large space for an encampment alongside the *Kho'jak* stream (about a mile from the village), which has here a broad stony bed like most mountain rivers, through which the river winds in several streams. At this time of the year, winter, the stream at this part is small, but clear and sweet, with a fast current. The drawbacks as an encamping-ground are that the place is liable to violent winds and dust-storms, and in the winter there is some danger of being snowed up. Wood, too, is scarce in the district, and the local supply is soon used up if a force has to halt in bad weather. The village and encampment are situated just within the range of low hills at the entrance of the gorge of the *Kho'jak* stream. These hills are bare and somewhat bleak, but the view is fair on the whole. There is a view N.E. into the Pishin through the entrance of the pass, but it is not extensive. Mount Takatu', 10,500 feet, is visible across the valley. There is considerable cultivation along the hill-slopes.

The road leads right through the *Kho'jak* River in its several beds altogether for about  $\frac{1}{2}$  mile, then over some uncultivated lands for about 4 miles to Rahamdil *Kha'n's* village, and then through the Arambi stream, after which it passes a series of water channels, or torrent-beds, for  $2\frac{1}{2}$  miles to Badwa'n. These beds are stony and full of detritus, which is washed down in enormous quantities from the bare hills to the s.; in fact, the whole country between the streams is waterworn and appears to be scoured after all heavy rains. It, with the *Kho'jak* and Arambi streams, is liable to sudden floods, when the water rushes down with great violence, but to no depth. The road is, on the whole, bad, except in fine weather, and in bad weather, if not impassable, would give great trouble to baggage-animals. The higher places between the river-beds, where the water cannot scour, are usually cultivated, and there are patches of cultivation along the hill-sides.

At 4 miles to the left, close by the road, are passed Rahamdil *Kha'n's* villages of the Mu'sizai sept of the Tor Tari'ns, a largish place, to the back of which, over the low hills, lie the villages of Mi'r Kalam *Kha'n*, of the Ka'kozai sept of the Achakzais.

There is an interesting a'sya', or watermill, near this, with a raised ku'l (open watercourse) leading to it, and close by is a ka're'z, but most of its wells are dry. Some distance to the right also lie Brijan Kala, called also Auli'a

Kala after its malik, of the Ma'ezai sept of the Tor Tari'ns about 4 miles off, and Da'dgwal, of the Mu'sizai sept of the same tribe, about 5 miles distant.

A noticeable feature in the country is the peculiar glacis or slope up to the hills on the valley-sides, which is also to be seen on the other side of the Kh'o'jak Pass in the Kadanei Valley. The houses also differ a good deal in build from those on the other side the *K'h'o'jak*, the peculiar domed roof is nowhere seen here. The kile's (properly *kizhdais*), or black semi-permanent tents of the Achakhais, are to be seen dotted all over the hill-sides and the plain. Large quantities of sheep and goats are to be seen grazing, but not many cattle: horses are to be found in the Sayad villages engaged in the Kara'chi horse-trade.

Badwa'n, 5600 feet, malik She'rdil *Kha'n*, is a To'r Tari'n village of the Badozai section; not particularly large, but straggling, like all the villages of the Pishin. Supplies were plentiful, and willingly offered—bhooza, barley, wheat, eggs and butter, ghee, fowls, sheep and goats, and also several Persian greyhounds were offered for sale, but all the prices asked were exorbitant; water is plentiful from a small stream. Trees are seen on the hill-slopes and on the tops of the hills, but otherwise the country is bare of trees as usual. The chief natural products are southernwood and a weed like an onion.

There is a fine view from the village over the valley. To the s.e. is the *Ghaz* line of hills, separating the Pishin and Sha'iko't (Quetta) Valleys, behind which, lying to the s. of Quetta, rises Mt. Chiltan to a considerable height. To the e. lies Mt. Takatu' and the snow-capped peaks *Zarghu'n*, *Pi'l* and *Kand*, in succession, to the n. of Takatu'. Behind these ranges again is visible the round snowy head of Mt. Chappar in the distance. About 6 miles distant to the e. lie the Sayad villages of *Shahda'd* and *Sayad Paind*, and beyond them again, at some 10 miles, the Tor Tari'n village of *Ali'zai*.

#### SECOND STAGE.

*Badwa'n to Ali'zai*. 12½ miles. General forward bearing, 90°. 12th March.

The road runs mainly through light sandy soil at the foot of the hills to the n. of the Pishin for about 10 miles, but for the last 2 miles, it goes through torrent-scoured country, where it is stony and covered with detritus. In parts it is broken by water washing through the soil and creating irregularities in the surface, and it crosses several small nullahs with hard sandy bottoms and steep difficult banks. In fine weather the road is good, easy and pleasant, but heavy and troublesome for baggage-animals after rain or in bad weather, especially in the stream-beds or broken ground, where the soil is liable to become quicksand in places. Opposite Badwa'n the River *Chór* runs a few hundred yards to the s. of the road. Here its channel is very deep, and its banks impracticable except by ramping. About 5 miles out, to n., a mile distant from the road, are the ruins of *Sayad Sa'lo*, a large village, the inhabitants of which have removed to the Quetta district. At 6 miles out, the road passes *Sayad Paind*, 5 miles s. of which lies *Karbe'la*, whose inhabitants claim to be Sayads, but are disowned by them. The *Karbe'las* seem to be a sept apart, for neither Tari'ns, Ka'kars, Dura'nis or Sayads care to own them. About a mile off the road to n. lie three villages in quick succession, *Haji'zi*, *Shahda'd*, and *Gauri*, the first two are Sayad and the latter an *Ali'zai* (Tor Tari'n) village. Two bad nullahs are passed just before reaching *Sayad Paind* and the River *Chór* shortly afterwards. The villages about here lie pretty thick, and the land is extensively cultivated. After passing *Gauri* the road goes through a graveyard, in which is a mound with a Sayad *Pi'r's* (saint's) tomb on the top of it. His name was *Ajaiab*. Shortly after this it runs past *Ajabzai*, a Sayad village: to the s. of this, about ½ mile distant, is a copse or

enclosure of trees, said to have been the residence of Ajaiab, the Pi'r above mentioned. Here also to the n., about 4 miles distant, and close under the hills, are visible the huts of some Ka'kars of the Sulima'n Khe'l section. The road next passes the A'li'zai (Tor Tari'n) village of Sayamzai, and finally, after crossing a bad nullah, reaches A'li'zai (Tor Tari'n) itself, about a mile further on. All the villages, especially Shahda'd, are large for Afghan villages, and appear to be well-to-do. The inhabitants have a more civilised appearance than I have yet seen elsewhere, and seem well disposed towards us. A great number speak Hindostani.

A'li'zai, 5500 feet, is a large well-to-do Tor Tari'n village. The supplies were plentiful, principally as before, but the prices were much more reasonable. Bullocks, horses, camels, were offered for sale. I saw also large quantities of sheep and goats and donkeys grazing, and near A'li'zai plenty of cattle.

The country about looks fertile, and is a good deal under cultivation. The natural products noticeable *en route* are tamarisk, southernwood, moss, camelthorn, the onion-like weed above mentioned, and a mossy shrub with a long flower-stem to it. Trees also seem more plentiful than usual, and here and there near the villages are some fine ones. Near A'li'zai there is an interesting series of a'sya's (watermills) along the line of a stream, which is raised by embankments at the head of each a'sya', and then shot down into it by a wooden shoot. These mills are well worked, and used to pay a tax of Rs., 5½ yearly to the Ameer's Government.

A fine and clear view of the peaks above mentioned, Chiltan, Takatu', Zarghu'n, Pi'l, Chappar and Kand is obtained here, all lying to the s. and e., and at this time of year all snow-clad: to the n. runs a low line of volcanic hills about 4 miles distant. Up to these the glacis above mentioned is longer and more marked than usual. A'li'zai lies on the slope, and from it, accordingly, an extensive view of the Pishin is obtained.

### THIRD STAGE.

*A'li'zai to Khu'shdil Kha'n.* 11 miles. General forward bearing, 110°. 14th March.

The road at first runs through light sandy soil, more or less covered with detritus and scored by the rains. After about a mile it crosses the River To'ghai in its several branches, all of which have stony bottoms and no banks to speak of, and the water is about ankle-deep. At 4 miles it crosses the River Muzarai, a similar stream in all respects. At this point the hills to the n. of the Pishin approach to within a mile of the road, and the country is much water-washed and stony. The road then passes through a much broken country intersected by deep nullahs, which would give a good deal of trouble in wet weather, as far as the 9th mile, where it crosses the River Lo'ra. The soil in the broken land is clayey, and in wet weather slippery and bad for animals. At the point where the River Lo'ra is crossed the river has low and easy banks and a stony bottom. Its bed is about 50 yards broad, and the stream knee-deep. After this the road passes over a stony water-scoured country, and crosses several streams and torrent-beds, the water about ankle-deep, for about a mile, when the River Barso' is reached—here of a similar nature and depth to the River Lo'ra—and a mile further on, through cultivated fields, lies *Khu'shdil Kha'n*. As may be supposed, the road winds a good deal, but its general direction is E.S.E. It may be pronounced to be bad in anything but very fine and dry weather, and would always be troublesome for baggage-animals or wheeled carriages. It is, however, the best line to take, running as it does as near the hills as practicable, for all the streams, which are here



shallow with low banks, very soon cut deep into the sandy and clayey soil formed by the wash from the hills, and become formidable streams, with high overhanging banks, impracticable without ramping, while the land about them is much broken and cut into by the annual rains. There is a short cut from A'h'zai to K'hu'shdil K'ha'n by the village of Bagarzai, but it is not a desirable route on this very account.

The villages are numerous about this part of the valley, which is thickly populated. From a point on the road near the River To'ghai the following are visible. To N. Ka'kozai and Madat (Abdal), both Achakzai villages—A'ta' Mohammad (A'li'zai) and Brahamzai (malik, Sayad La'l). To the S. and S.E. Ma'likai (Tor Tari'n), Ya'singzai (malik, Sayad To'ti) and Ya'singzai (malik, Sayad She'rbat), Sopan'zai (A'li'zai) and two Bagarzai villages (maliks, Sayad Payo and Sayad Alab). These villages vary in distance from 1 to 6 miles. At 7 miles out, about 1 mile to N., is another Brahamzai village (malik, Sayad Khama'ndai), on a hillock, and about half a mile to S. of this is Brahamzai proper, the malik of which is Do'st Mohammad,—by which the road passes, at this point turning S.; from here a garden with trees near the River Lo'ra, belonging to Sayad Payo of Bagarzai, is seen. About a mile S. of Brahamzai lies Sama'lzai (Sayad), through which also the road passes. Near this to S. is the remains of a small artificial hill, apparently an old fort—there are remains about it. It is like the fort at Quetta on a small scale. The natives know nothing about it, but call it Spi'n Khila (the White Fort). The To'r Tari'n village of Manzakai lies about a mile to S. on the side of a low hill. From Sama'lzai are visible to E., at about 6 to 8 miles distant, three Lu'r Kha'nizai (Tor Tari'n) villages, whose maliks are Mohammad Sa'dik, La'l Mohammad, and Vaki'l. After leaving Sama'lzai the road runs E. again to Dab Kha'nizai, near which to N. is an empty fort called Zarra Khila, for a mile, and finally S. for another mile to the cluster of villages around the fort of K'hu'shdil K'ha'n, all of which are Tor Tari'n, except Allahda'd, which is Sayad. It appears that one Mu'lla Allahda'd was a Sayad Pi'r (saint), and there is a Zia'rat (sacred tomb) to him there. The Tor Tari'n villages are She'kha'lzai, Kama'lzai, Nu'rzai and Ma'likya'r, and near the latter are the remains of a deserted village of the Ma'likya'rs, who moved to the present site not very long ago. At the head of the valley to the N.E., about 8 miles distant, are the remains of the fort of Ha'ji K'ha'n, the head of the Amand K'he'l Ka'kars. Of these villages only Ya'singzai, Manzakai and Ma'likya'r are of any size.

The country passed through is similar to that previously described, and its natural products and crops the same. The ground near the hills is uncultivated except in patches, but there is extensive cultivation along the line of villages, except in the broken ground, which is quite bare. Water is stored in small irrigation-tanks in places, and ku'ls and a'sya's are visible everywhere. There is a newly-dug ka're'z running between Dab Kha'nizai and Sama'lzai, the wells of which are very deep, small and well dug. Sheep, goats and donkeys are to be seen all along the hills, and about K'hu'shdil K'ha'n cattle in quantities. There are trees about the villages and pistachio-trees along the hill-slopes to the E. of K'hu'shdil K'ha'n, otherwise the country is bare. The people en route appear, as before, to be well-to-do, speak Hindostani to a great extent, and have travelled a good deal.

K'hu'shdil K'ha'n, 5600 feet, is now an empty fort, partially ruined. It is built in the usual way, and is about 100 yards square. It was from this that the Ameer's naib (lieutenant), Nu'r Mohammad K'ha'n, Ba'arakzai, governed, but he fled on our approach, and the place is now used as a Government godown (warehouse), in charge of another Nu'r Mohammad K'ha'n, a Belo'ch, in our employ. The supplies now collected are of all sorts, and very plentiful; but the prices are very high. A road from this leads, *via* No'a Ba'za'r (Batatai, Tor Tari'n), to Quetta, and one is said to lead, *via* the villages of Mehtarzai

and *Khunjaigai*, through a pass near *Mt. Kand* to the *Zho'b* valley. *Khu'sh-dil Kha'n* is said to be the site of a proposed British cantonment. Water, as usual here, is plentiful and good. There is a view over the valley to *Mt. K'ha'ja Amra'n* and the *Gwa'ja Pass*.

#### FOURTH STAGE.

*Khu'sh-dil Kh'an* to *Sharan Ka're'z*.  $6\frac{1}{2}$  miles. General forward bearing,  $108^{\circ}$ . 17th March.

The road leads past the village of *Kama'lzai* (*Tor Tari'n*)—over a detritus-strewn country at an easy upward gradient, towards the hills to N.E. of the *Pishin* for about 3 miles, something S. of E., after which it turns northwards for a mile, bearing  $75^{\circ}$ . During this mile it crosses several torrent-beds, and is somewhat hilly. After this it follows the line of the River *Sharan*, in an easterly direction. At its entrance the gorge of the river is about 300 yards wide, but it rapidly narrows to about 80 yards, and at half-a-mile from the entrance the road descends into the river-bed, which is hard and stony. The hills on either side are not high, say 250 feet in the highest part, and are composed mostly of a soft slaty and shaly rock. The bed is narrow in places, not more than 20 yards wide, so that camels or baggage-animals, and all wheeled carriages, would have to go in single file. The river itself is usually an insignificant stream, and there are no signs of its ever becoming a formidable torrent. The road up it winds a good deal, but the upward gradient is not great. At about a mile from the camping-ground the road leaves the river-bed, and goes over a small kotal (pass); from this to the camp the gradient is steepish, but the ground is firm. Such a road must, from its nature, be impracticable during wet weather, but the stream would soon run down after heavy rains. It would be easy to find a line for a good road practicable in any weather along the river-side. No villages, or even huts, are met with after *Kama'lzai*.

*Sharan Ka're'z*, 6300 feet. There is no village here, and no huts for some distance off the road. The hills are inhabited by *Ka'kars*, of the *Sulima'n Khe'l*, *Amand Khe'l*, *Pa'nizai*, and *Shamozai* sections, who do not here live in villages, and all their huts are removed some distance from the road for reasons of safety. The *ka're'z* was the property of *Sayad Mu'lla K'ha'lakda'd* (= *Allahda'd*), whose *zia'rat* (tomb) is near *Khu'shdil Kha'n*, and now belongs to the *Tari'n zami'ndars* (landowners) of that neighbourhood; beyond this point it belongs to the *ka'kars*. There are several narrow, deep wells in it, and the water is good. The camping-ground is hilly and on broken ground, but the space is fair and the soil dry; it is, however, liable to high winds. The main range of the hills is about 3 miles to the E., but points near camp, for picquets, can easily be found, effectually overlooking the country. There is a fine view over the *Pishin* from many points near. A mountain path leads to *Barsho'r* to the N. in the country about *Mt. Kand*. Supplies are fair.

The country passed through as far as the gorge of the River *Sharan* is much as before; cultivation near the villages round *Khu'shdil Kha'n*, and then stony water-scoured country, crossed by many small torrent-beds, and cultivated only in patches in the hollows. At this time of year, March, some of the wheat was about 6 inches high. The southernwood and camelthorn are thick, and the camel-grazing, consequently, is here plentiful and good. Barbary bushes may also be seen pretty thick in some of the torrent-beds. In the river gorge, grass, both fine and coarse, and reeds are to be found, especially about the damp ground, caused by the frequent springs in its neighbourhood. Wheat is also grown about the river wherever practicable. After the kotal the country is very broken, but the natural products are the same as before, and even in

these hills wheat and barley cultivation is largely carried on by means of ku'ls, or artificial watercourses. Cattle and sheep are to be seen grazing on the lower slopes. Trees are scarce, but a few pistachio-trees are to be seen about the hills. The climate is not particularly pleasant, but not unhealthy. Now, i.e., in the spring, the sun is hot in the daytime, but frequently a bitterly cold wind blows, and at night there is a hard frost. In wet and cloudy weather it is very cold, with rain in the valleys and snow on the hills, above 6000 feet. These remarks apply to the N. of the Pishin generally; the eastern slopes of the *Kho'jak* are much warmer.

#### FIFTH STAGE.

*Sharan Ka're'z to Balozai Ka're'z.* 8½ miles. General forward bearing, 96°. 19th March.

The road leads towards the Surai Pass, general forward bearing, 108°, at first through very wild and broken country, with sharp ascents and descents in rapid succession, but after a few hundred yards it follows the flat pebbly bed of a mountain-stream, the River Surai, which is about 70 to 100 yards wide, with a general bearing of 110° from Sharan Ka're'z. The gradient is at first easy, but after about a mile the ascent becomes considerable and very trying for baggage-animals, and the river-bed gradually narrows to 30 yards after 2 miles, and to 15 yards after 2½ miles. The stream is usually dried up, only a little water being found trickling in places from springs in its bed. At one point, 2½ miles from where the road enters the nullah-bed, a short zigzag, with a 12-foot road, has been recently made, to avoid a narrow place which is only 4 feet wide. After this the road in the stream is the reverse of good, being 5 to 13 yards wide, with a considerable ascent. At about half-a-mile from the top of the Surai Pass, which is reached in 3½ miles from Sharan Ka're'z, a very winding zigzag has been recently constructed, at a fair gradient, with a 5-foot road. The ascent over the pass is about 300 feet. The descent into the Dof Valley is at first very rapid and winding down a recently made road,\* and then for a mile down the bed of another stream, also called the River Surai, which is similar in all respects to its namesake on the Pishin side. The general bearing forward of the descent is about 167°, or nearly S.E. At the point where the stream debouches on to the valley the road to Balozai Ka're'z turns northwards across the Dof Valley (general forward bearing, 80°) till the village is reached about 4 miles further on across the River *Surkhab*; here a dry insignificant torrent-bed, about 50 yards wide, with a stony bottom, and banks from 2 to 5 feet high, easy and practicable in any weather. The road as at present used is one only practicable in fine weather, but there is nothing great in the natural difficulties of the pass, and a little engineering should render it an easy one and always practicable.

A bridle-path leads from Sharan Ka're'z to Sa'ghai, over a hill about 300 feet higher than the Surai Pass, capable of being rendered practicable for troops. Another bridle-path leads from the bottom of the zigzag in the Surai Pass to Lu'r Anga'ng, and another again from that place to No'a Ba'za'r in the Pishin, viâ the *Kharzangai* Pass. A main road leads S. from the Dof Valley to Quetta, viâ *Zarghu'n Ka're'z* and *Khu'shla'k*, and another N. to the *Zho'b* valley, viâ *Khunchagai* on the slopes of Mt. Kand. And lastly there is a cattle-track near the village of Shakar into the Pi'l country to S.E.

The country about the Surai Pass is very wild and broken, composed principally of a series of conical hills, of a soft shaly and slate rock, which disin-

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\* All constructed, I believe, by Lieut. Wells, R.E.

tegrates on contact with the air. The overgrowths are southernwood, camelthorn, and coarse grass in tufts, and dwarf tamarisk and barberry bushes are to be found in the river-beds; some Sharwa'n or Shnai (? pistachio) trees also grow on the hills, and I saw one cherry-tree. Towards the summit of the pass there are some olive-trees, a fragrant bush, something like broom in appearance, and a plant like a dwarf holly.

At the top of the pass there is a fine view over the Pishin, but no cultivation is to be seen anywhere about it.

The Dof Valley is an upland valley at a great elevation, 6500 feet. It is about 15 miles long by about 8 broad, and its general direction is from N.N.E. to S.S.W. It is closed at its S. end by the gorge of the River Surkha'b, and at its northern end by some low hills. The valley is drained by the River Surkha'b, into which run two smaller streams, the River Ro'd and the River Nari'n. The remarkable glacis visible in the Pishin is also to be observed here, and the water-scour is also considerable. Cultivation by means of ku'ls and ka're'zes is carried on by the river-banks and in the hollows as usual. Wheat, millet, Indian corn, and barley are the crops grown. Where not cultivated, the country is bare of trees, except about the villages, and covered over with a thick growth of camelthorn and southernwood. The soil is light, sandy, and friable, and not nearly so good as in the Pishin. Ka're'zes are especially numerous, being dug to a considerable depth, and there seems to be no lack of water. Sheep and goats and cattle are plentiful, and supplies of the ordinary kind obtainable everywhere.

The valley is well populated; the number of villages being no less than twenty, but none of them are large, excepting Balozai Ka're'z and Kha'nizai Ka're'z. All the inhabitants are Ka'kars, and appear quiet and well-to-do, despite their bad name, excepting those about the Surai Pass, who have a poverty-stricken appearance. The villages are, going up the valley from the S., Kur'zanga'ng, Lu'ranga'ng, Mo'hammad Shari'f, Ksho'i Ka're'z, Zarghu'n Ka're'z, Shakar, Kha'nizai Ka're'z, Me'kha'n, Sa'ghai, Shama'wan, Balozai Ka're'z, Wochak'kla, De'wad, Dilsho'r, Murghai, Nari'n, Tlarai, Bargai, Tlarai (2), and Ka'han.

A view of Mts. Kand and Takatu' is to be obtained anywhere in the valley, and also of Mt. Surghwand, an isolated peak to the E.

The climate at this time of the year, spring, is pleasant, the thermometer ranging from 75° in the day to 25° at night, and the cold wind of the Pishin is shut out by the surrounding hills.

Balozai Ka're'z, 6600 feet, is a Ka'kar village, of the Pa'nizai section, and is situated in the centre of the valley on the River Ro'd, near some low isolated hills. It is of some size. Supplies are of the usual kind and plentiful, prices being high, as elsewhere in this part of Afghanistan, though not so high as placed by the political authorities. The camping-ground is about a mile from the village, on the slopes of a low hill. The space is large and the natural drainage good; water is near, plentiful, and good.

**FIRST EXCURSION.**—*Balozai Ka're'z to Gwa'l.* 10 miles. General forward bearing, 220°. 21st March.

The road leads off S.E., past the village of Kha'nizai Ka're'z, through a cultivated country for about three miles, when it nears the Pinakai Hills. It here enters a small pass or gap in the hills by an insignificant nullah-bed. It then passes along the southern face of the hills for about half-a-mile, and then enters another similar small pass or gap. Here it is somewhat difficult, and the descent is steepish, about 4°, following a nullah-bed for about 400 yards. The nullah is about 10 yards wide, and would have 3 feet of water in it after

rains. Both these passes can, however, be easily turned by following the bed of the River *Ghobarga*. After the second pass the road debouches, opposite *Zarghu'n Ka're'z*, on to the narrow valley called the *Gwa'l Valley*, which is about three miles wide, and follows down the centre of it in a s.e. direction. Here it is stony and firm, and, for an Afghan road, good. It crosses several small torrent-beds, and two stream-beds, viz., the River *Ghobarga* and the River *Dargai*, neither of which would be formidable in any weather. These join about  $2\frac{1}{2}$  miles from *Gwa'l*, and form the *Gwa'l River*, which about *Gwa'l* is a broad torrent-bed. The average gradient of the road is about 50', or one in 100. The *Gwa'l Valley*, down which these two streams drain, runs along the base of *Mt. Takatu'* into the *Sha'l Valley*, say some 20 miles. The road may be pronounced good for Afghanistan, and should give no trouble at any time, except for the first three miles, when it would be troublesome in wet weather.

The country in the *Dot Valley* is as before mentioned. *Ku'ls* and *ka're'zes* abound everywhere, the wells in the latter being very deep. About *Kha'nizai Ka're'z*, *manji't*, called locally *mane't*, is cultivated for dyeing purposes, giving a bright red dye. It is said locally to grow nowhere else, but I have seen it about *Kandaha'r*. The cultivation is costly and troublesome apparently, as it is grown, like celery, in deeply furrowed land. The value of the crops in the valley is said to be Rs. 1000, and they belong to a good many owners. Where not cultivated, the land is water-scoured and stony. There are a good many fruit-trees about the village. The *Pinakai Hills* are water-scoured, undulating and stony, and appear to be formed of conglomerate. There is some cultivation along the flats at their bases. The *Gwa'l Valley* has much the same appearance as the other valleys in this country, cultivated in patches, but generally stony and covered over with a growth of southernwood and camelthorn. On the w. side are the *Pinakai Hills*, of no great height, forming a much broken hilly country between this valley and the gorge of the *Surkha'b*, and on the e. side are the *Dargai Hills*, rising to a considerable height, culminating in the peaks called *Uzhdö*, *Surana'*, and *Mu'llaba'ri*. The glacial observable elsewhere is also to be remarked here. The soil in the valley does not appear to be deep, about 2 to  $2\frac{1}{2}$  feet over conglomerate. It is very light and friable. Water seems to be abundant everywhere. Sheep and goats, but no cattle, were seen feeding in quantities. There are a good many trees on the hill-slopes about *Gwa'l*.

The villages passed were *Kha'nizai Ka're'z*, a large *Pa'nizai (Ka'kar)* village, with a kind of mud bastioned fort in it, and *Zarghu'n Ka're'z (Sara'ng-zai, Ka'kar)*, and *Ksho'i Ka're'z (I'sa' Khe'l, Ka'kar)*, both open villages of a fair size.

*Gwa'l*, 6100 feet, is a long straggling open *Pa'nizai (Ka'kar)* village of some size. Supplies are sufficient: bhoosa, barley, grass, firewood, milk, eggs, fowls, goats and sheep. Prices are not quite so high as usual. The camping-ground is in cultivated land, but the space is large; water, near, good, and plentiful. There is a fine view of *Mts. Takatu'* and *Zarghu'n* from the village, and from the *Pinakai Hills* to the rear, of the *Shargandai Peak* to the n., and of *Mts. Surghwand* and *Tsa'ru* to n.e. A path leads n. into the *Surkha'b Valley* over the *Pinakais*, and these hills can be turned by an easy road a little to the s. into the *Pishin valley* towards *Khu'hadil Kha'n*.

SECOND EXCURSION.—*Gwa'l to Ukhmughdai Pass and A'madu'n*. General forward bearing to *Pass*,  $139^\circ$ ; to *A'madu'n*,  $107^\circ$ ; to *Pass*,  $9\frac{1}{2}$  miles; to *A'madu'n*,  $14\frac{1}{2}$  miles. 22nd March.

The road follows the River *Gwa'l* for about half-a-mile, and then turns across the valley to the entrance of the *Gurkhai Defile* in the *Dargai Hills*, which is

reached in three miles, bearing from Gwa'l 188°, or s. So far it is easy, and would present no difficulties at any time. At the entrance to the defile, which is in fact the gorge of the River Gurkhai, the river is crossed. It is there some 30 yards wide, but the banks are easy and firm, the bottom stony, and the stream usually insignificant. After entering the gorge the river has to be frequently crossed, its bed being from 20 to 30 yards wide, the stream small and rapid, bottom stony, and the banks nowhere difficult. It seems, however, to be capable of swelling to a depth of 5 or 6 feet in the rains. The road follows one bank or the other all through the defile, and is hilly and broken, in places degenerating into a rocky mountain pathway. The defile varies considerably in width from 50 yards, in places, to 500 yards. It is about 2½ miles long, with a general forward bearing of 135°. The rocks are precipitous where the defile is narrow, and several hundred feet high, while the broader places are very hilly and broken. The average gradient of the river-bed is about 1° 30'. The road in the defile may be pronounced passable for camels in ordinary weather, and with engineering might be easily made good, and, if bridged, practicable and easy in any weather, the difficulties being insignificant. At 5½ miles the Sagarband Pass is reached. This is a narrow entrance at the top of the defile, after passing which the road enters the Sagar country, a kind of valley in the hills, running parallel to the Zarghu'n range, but presenting as wild an appearance as can be well imagined. It is one mass of small, conical clay hills, amid which the road winds, following the River Sagar, which it constantly crosses. The River Sagar is a small mountain-stream, with a sandy bottom and soft clayey banks, which are in places steep and several feet high. It is usually dry, but is capable of becoming an awkward torrent. The windings of the road are so sharp and frequent that it is impossible to see beyond a few yards at a time. Towards the head of the stream the road enters a narrow gorge some 10 feet across, the ascent, which is usually slight, being here considerable. After this it crosses a small valley about half-a-mile *e.* to *w.*, and a mile *n.* to *s.*, at the end of which is the Ukhmughdai Ko'tal. The ascent of the ko'tal is very steep for the last hundred yards, the angle being about 15°, and the road, which has been hitherto soft and easy, though hilly and winding, is here stony and bad. The total distance from the Sagarband Pass to the Ukhmughdai Pass is 4 miles, and the general forward bearing 100°. After the ko'tal is crossed, the road turns southwards 5 miles, bearing forward 60° to A'madu'n, a largish A'dizai (Ka'kar) village in a lumpy valley called the Ighbarg. The road here presents no difficulties. Taken as a whole, the road may be called fair, and could be easily made good, but could be used only when the country was quite settled, as the excessively broken character of the Sagar country would render it a sure hiding-place for thieves, dacoits, and bad characters. Water is not lacking *en route*. At A'madu'n it is good, but salt and unwholesome in the Sagar and brackish in the Gurkhai defile.

The country passed in the Gwa'l Valley is similar to that before passed and described. The I'sa' Khe'l village of Wulgai, 2½ miles, and Kha'nai, 6 miles distant, are to be seen across the valley in the Pinakai Hills from the entrance of the Gurkhai Defile. Between Gwa'l and Wulgai is to be seen a mountain-path leading to No'a Ba'za'r in the Pishin. The Gurkhai Defile, where narrow, has very high precipitous sides of grey limestone rocks, and in the wider places it is broken up by small hills of soft red and grey clay. A path leads off to the right to Quetta, about half-a-mile from the Sagarband Pass. The Sagar country is principally composed of these low, clayey hills, and in places of soft disintegrated slate or shale. The soil varies greatly in colour—white, grey, yellow, and a bright red in the clay, and bluish in the slate hills. Trees are scarce, except on the snowy slopes of Mts. Pi'l, Mangal, and Zarghu'n, and

the overgrowths are as before observed: no signs of cultivation anywhere, or even of human habitation. Despite its broken character, the country is not difficult to sketch, the essential bearings being obtainable from any of the higher points in it. Mt. Takatu' presents a magnificent front, and Mts. Zarghu'n, Mangal, Pi'l, Surana', and Surghwand can all be seen clearly from the Ukhmughdai Pass. Beyond the Ko'tal, 2½ miles, bearing 145° across the Ighbar Valley lies the Pa'ni'zai (Ka'kar) village of Bra'hima'n. From this a road is said to lead across the Zhawar Plain, described as being like the Pishin in size and appearance, into the Marri (Belo'ch) country. From A'madu'n (A'dizai, Ka'kar) a road leads through a pass to Kudi'n, on the Tal—Cho'tia'li road from Balozai Ka're'z, *via* Go'gai, 5 miles, and Ro'dgai, 20 miles on. The whole country in these mountains is held by Pa'ni'zai Ka'kars, but in A'madu'n there seems to be a considerably mixed population.

The barometer at Gwa'l is 24.3, and at Ukhmughdai Ko'tal 23.4, which makes the latter place level with Balozai Ka're'z.

#### SIXTH STAGE.

*Balozai Ka're'z to I'saf Kach.* 9½ miles. General forward bearing, 108°. 24th March.

The road runs along the bed of the River Ro'd for a mile-and-a-half, the bed of which is broad and stony, but the stream usually insignificant. It then goes through some cultivated land for about a mile, when it enters the hills, after which it is good and clearly marked, but the ascent is steepish, about 34°. At about 3½ miles a small gap in the hills is reached, and the road follows the bed of another stream, the River Zadu'n for 2 miles. It is winding and stony, but nowhere difficult, though the ascent is again considerable. After this a graveyard and some huts, at a place called Mo'sai, are reached, being the highest point on the road, which then descends again to the bed of the River Ro'd, running over undulating sandstone hills for 2 miles. The river is here still broad, but the stream is small and the banks easy. After this the road either follows the river-banks or its bed to the camping-ground, which is about half-a-mile beyond the village of I'saf Kach. The gradient of the bed of the River Ro'd is about 1 in 80. There are no engineering difficulties on this road, and, considering the mountainous nature of the country traversed, it is good, and, excepting that the rivers passed through are liable to floods, it should be passable at any time.

There is nothing fresh to be noticed about the country passed through in the Dof Valley. The villages passed *en route* were Dilsho'r (Ba'zai, Ka'kar) and De'wad (Mehtarzai, Ka'kar). After the hills are entered, the country is hilly, but not particularly broken. The soil and hills are mostly composed of soft clayey shale. The overgrowths are as usual, and there are no trees. In the gorge of the River Zadu'n, varying in width from 100 to 800 yards, the country is broken, and the hills somewhat bare, their appearance being very much that of those in Sagar, above described, and the same remarkable occurrence of red, yellow, and grey clays is to be observed. There are a few trees about. At and after Mo'sai the hills as far as the River Ro'd become undulating, and are apparently of sandstone, and trees become more plentiful. Up to this point no cultivation is to be seen after the hills are entered. The gorge or valley of the River Ro'd is about half-a-mile broad, the country here becoming mountainous rather than hilly. There is considerable cultivation apparently of wheat and Indian corn, along the river-side by means of ku'ls. The principal points noticeable are the trouble taken to keep the river in its place by means of stone groins and walls, and the planting of willows along

these, by which means arable land is reclaimed from the river; and the change in the structure of the houses. The walls are of mud over stone from the river-bed, and the roof is of thatch, plastered over with mud. Their appearance is much rougher than that of the huts in the Pishin. There are a good many fruit-trees (apricots and plums) about the villages, and trees on the hill-sides. The villages passed are I'saf Kach (Shamozai, Ka'kar) and Ko'sh Kach (Ba'zai, Ka'kar), near each other. They are not large.

I'saf Kach camping-ground, 7400 feet, is in a wide place in the gorge of the river, overlooked by high hills. There is room for about a brigade. The soil is sandy, but the natural drainage is good. A road runs from this point up the River Pinakai, *viâ* A'madu'n and Sagar, to Quetta. From the hills at the back of the camp a view southwards of Mts. 'Takatu', Mangal, Zarghu'n, and Ma'zhwô is to be obtained. Mt. Pi'l is not far to the s., and a peak is pointed out as Chapar, to the s., but this is doubtful. Mt. Surghwand is to be seen to the e. and Mt. Kand to the n. The inhabitants are all Ka'kars, principally of the Sara'ngzai section.

#### SEVENTH STAGE.

*From I'saf Kach to Ispira Ra'gha.* 16 miles. General forward bearing, 116°. 25th March.

The road follows the winding bed of the River Ro'd almost as far as the Ush Ko'tal, 12 miles. Its general direction is here easterly, but there are two sharp turns to the s. at the 4th and 7th miles. The river-bed is stony, but nowhere difficult, and the stream insignificant. The gorge of the stream is at first about 800 yards wide, narrowing to 400 yards at the 7th to the 8th mile, and the hills on either side lofty. At the 10th mile the hills and the river begin to disappear, and the country to get more open. As the Ush Pass is neared, the road passes through a lumpy somewhat broken country, but is easy. As far as this the road in ordinary weather is, for a mountain-road, easy and good, the ascent being slight, about 1 in 65. The ascent of the kotal is short and not difficult. When this is crossed, the descent is somewhat sharp down the bed of a narrow mountain-stream, the River Ush, which the road follows for a mile and then runs for two miles down the bed of the River Ikhbarg southwards at a considerable incline. The river-bed is stony, and about 100 yards broad, and the stream slight. After about 3½ miles, from the Ush Pass, the Ispira Râgha plateau is seen to the right, almost due w., and a détour from the road onwards, which runs nearly due e., is made for half-a-mile to obtain a camping-ground. The road is nowhere difficult, being hilly only at the Ush Pass, and at the points between the River Ush and the River Ikhbarg. Guides, however, are necessary, as it would be by no means easy to find the way without them, and wrong turns might easily be taken in the Ro'd gorge as well as in the more open hilly country above it. It should be remembered that the River Ro'd is liable to floods over 6 ft. deep, and that the River Ikhbarg also bears signs of being deeply flooded at times. Good water is plentiful everywhere, being wanting only for a mile about the Ush Pass. There is room for a brigade, or even a division, to encamp in some open ground at Sraghar, about a mile beyond Shudand, and smaller bodies could easily encamp in several places *en route*.

A series of small hamlets rather than villages are passed in the Ro'd gorge, all within a mile or so of each other, as far as the ninth mile; they belong to all kinds of sections of the Kak'ars, but near Kudi'n up the River Sa'bonai about 3 miles, is Saghi'n, a Sayad village.

Four streams, the Rivers Wari'a, Sa'bonai, Wargai, and Shudand, run into



the River Ro'd on the right bank, but none on the left. After the ninth mile, at Shudand, there are no signs of cultivation, or even of human habitation.

The country at first is as before described—lofty hills on either side of the gorge of the River Ro'd. The main differences noticeable being the large number of willows and fruit-trees about the villages and along the river-banks. Cultivation in terraces is considerable—wheat, millet, Indian corn (maize), barley (and ? oats also) and lucerne, being raised. The practice of reclaiming land by groins run in to the river-bed before described is to be observed also here. Sheep and goats also abound. The houses or huts become rougher as the gorge is ascended, degenerating into mere grass and wood huts, the sides of which are sometimes scooped out of the hill-side. The inhabitants are Ka'kars of all sections, but Pa'nizais predominate. As the greater heights are reached, the hills become wooded, and, after Shudand is passed, the country becomes an uninhabited mountain tract, producing only timber. Besides the usual overgrowths, plum (be'r) trees, junipers, and conifers (probably cedars and cypresses) are to be seen along the hill-sides, and a bush like a rose. A broom-like plant also grows here which the natives use as medicine, smoking it like tobacco.

A grand view of the snowy range of Mt. Ma'zlwö is obtained to the s. from many points, and on the whole the country is pleasanter to look upon than is usual in Afghanistan, despite its wildness. The climate at this time of year (spring) is charming.

The hills appear to be composed, as usual, of sandstones and clays of various colours, slate and shale.

Ispira Ra'gha, 7800 ft., is merely the name of a plateau in the wild hilly country to the n. of Mt. Mazlwö. There is room for a brigade to encamp with comfort. No supplies can be procured, and there is no habitation within miles of the place. Water is obtained near from the River Lo'ghan. There is a fine view.

#### EIGHTH STAGE.

*Ispira Ra'gha to Khwa'ra.* 13½ miles. General forward bearing, 86°. 26th March.

The road runs back for a mile along the old track, after which it runs straight on due e. through the narrow mountain valley of the River To'pobargh for half a mile till the To'pobargh Pass is reached. The ko'tal is barely perceptible, and the ascent is very slight. After this the road runs along the valley, or rather upland plateau, drained by the River Mo'mand at the foot of Mt. Spinskhar. The ascent is gradual as far as the Nangalu'na Pass (8500 ft.), which is four miles out. After passing this, the road gradually descends in an e. direction down the river known successively as the Nangalu'na, O'bushtkai, and Khwa'ra. Like the ascent, the descent is gradual and easy. The road is throughout easy, good, and well marked. It is somewhat hilly and rocky about the passes and river-heads, but would nowhere give difficulty.

The country passed through is at first hilly and fairly open, and in general appearance like that described about Ispira Ra'gha. After the To'pobargh Pass there is a widish hilly plateau for a couple of miles, and just about the Nangalu'na Pass the country is broken and hilly, and somewhat rocky. After this second pass there is a wide plateau, with curious low flat-topped hills running across it n. and s. This plateau is bounded by the Spinskhar, Surlo', and Khargai ranges to the s., and by the Nangalu'na Hills and the hill lands of Ghobargai to the n., beyond which lies the Zho'b Valley in the

distance. To the E. is the remarkable table-like hill Mt. Sya'jgai, and the Chimja'n Ghar Hills.

The river-beds are broad and stony as usual, but have a slight gradient. They are usually dry, and, though the springs are not far apart, water is rather scarce. There are no signs of habitation till the eighth mile is reached, where there is a graveyard at Nasrat, near which, in the hills, but not visible, is a village called Ra'dingzai (Dumar, Ka'kar). At ten miles is the village of O'bushtkai (Dumar) on the road-side—a wretched little hamlet. Soon after this, signs of wheat-cultivation by means of ku'ls and kare'ze's are apparent, and in the hills are the villages of Gurmai and Kurbi (Zakhpe'l, Ka'kar). There is a path, said to be bad, leading from Gurmai, past Mt. Surghwand, as far as the Mehtarzai country about Mt. Kand. The inhabitants are all Ka'kars, and have a wild, squalid appearance. After the eighth mile trees begin to disappear, and the country to bear that treeless appearance so noticeable in Afghanistan. The overgrowths are as usual. The composition of the hills is, as usual, of clays and sandstones of sorts, but gneiss and schist are also found in places. About Khwa'ra there are a good many fossils. There is a fine view of the snowy ranges of Ma'zhwö, Spinskhar, Surlo', and Khargai to the s., and to the n., of Nanalu'na and the broken country of Ghobargai. Mt. Sya'jgai is very peculiar, and would be a landmark from any point. The country is pleasant to look at, and the climate now (spring) charming. Mts. Sukghwand, Che'sha'n, Chimja'n Ghar, and Matkhilar are also visible, besides those mentioned already.

Khwa'ra, 7900 ft., no village—a convenient spacious encamping-ground on the banks of the River Khwa'ra. No supplies, but water is sufficient.

#### NINTH STAGE.

Khwa'ra to Chimja'n. 6½ miles. General forward bearing, 89°. 27th March.

The road follows the line of the variously named river mentioned in the last stage, and now called the Chimja'n. It runs along its bed, now broad, or along the valley on its banks. Where it follows the bed it is stony, but easy and level, the descent being almost imperceptible, and in the valley it is sometimes a little hilly. It is good and easy throughout. There is water in places in the river-bed, but it is nowhere troublesome. The country presents the same treeless, water-scoured, stony appearance frequently noticed before. The overgrowths are the same as usual—camelthorn and southernwood, and fruit-trees about the village. Cultivation is carried on in patches by the river-banks. At this time of year (spring) there is green wheat to be seen about; barley and Indian corn are also raised. The country is thinly populated by Zakhpe'l Ka'kars and some Dumar Ka'kars, and only one village was passed *en route*, Sa'la'zh (Zakhpe'l). The huts are better, being the same as those in the lower Ro'd Valley about I'saf Kach. Cattle, sheep, and goats are to be seen feeding in places, and, as observed in the Ro'd Valley, there are signs of embanking the river to keep it within its bed.

The valley becomes wider and more open as the river flows downward, and there is a fine view down towards Smalan, E.S.E. The most remarkable feature being the isolated Mt. Sya'jgai above mentioned, which stands out in the middle of the valley.

Chimja'n, 7400 ft., is a Zakhpe'l (Ka'kar) village of some size at the foot of the Chimja'n Ghar Hills. Supplies are fair, but limited as to choice—bhoosa, firewood, grass, lucerne, sheep, and goats, but hardly anything else. A road leads N. from this, *viu* the Zaghl'u Pass, to the Zho'b Valley, and another N.E., along the valley to Dargai and China'li. The camping-ground is along the river opposite (s.) the village. It is spacious, but very stony.

THIRD EXCURSION. *Chimja'n towards Zho'b Valley. Pa'lkai Ko'tal, 8 miles.*  
General forward bearing, 341.° 28th March.

This excursion was undertaken to ascertain the roads leading to the Zho'b Valley from Chimja'n. The road leads at first through the Zaghl'u'n Pass for a mile. The Pass is a narrow gap between the Ba'shai and Chimja'n Ghar Peaks and is almost due N. of Chimja'n. It is about a mile long, being formed by the Zaghl'u'n River. The road follows the river-bed, which is about 50 to 100 yards wide and very stony, but the ascent is slight and the stream small. The general forward bearing is about 335°. After the Pass the Tarakai Valley is reached—an undulating plain about two miles wide between almost parallel lines of hills running s.w. to n.e. Those to the N. are called successively eastwards, Pla'nzhara and Ghwand, those to the s. Zwaisha. An apparently good road leads to the Zho'b Valley, past the Walto'i Peak in a n.e. direction (about 85°). There are two Ka'kar villages, Khwai (Khwaidd'zai) and Gundamarai (Mursia'ngzai) *en route* near this hill. A pathway leads N. to the Churmai (Ka'kar) country past the Ghwand Peak. The road on to Hindu' Ba'gh in the Zho'b Valley leads through another pass or gorge formed by the River Zaghl'u'n in the Pla'nzhara Hills, called the Spi'r Tangai Pass. The bed and gorge are here rather wider than before, and the road easy, with a slight ascent. It is about half a mile long, and the general forward bearing 20°. After this a shut-in hilly valley is reached, about a mile wide, between hilly ranges almost parallel running w. to e. Through this the road follows the River Zaghl'u'n at a general forward bearing of 322°. It then passes through a third short and widish gorge, the Tu'r Tangai Pass, in the Surmastaili Hills, at a general forward bearing of 330°, and then opens on to a third hilly valley, about half a mile wide, called the La'ndai Surai Valley, between the Surmastaili and Mali'v Tarkai Hills, but the country now assumes a more mountainous appearance, and the ascent of the river-bed is sharper. A road leads w. from the La'ndai Surai Valley to the Mo'mand Sara'i country, to the N. of Mt. Surghwand, in the direction of Mt. Kand, which it probably eventually reaches. After this the country becomes a mass of mountains, through which the road winds, following the river-bed, at a general forward bearing of 305°, as far as the Pa'lkai Pass, 8400 ft., which is reached in 8 miles. From this a glimpse of the Zho'b Valley is obtained about 10 miles distant, and bearings were got on to Hindu' Ba'gh (Surgarai) and Warghas (Mehtarzai), both in the Zho'b Valley. Mts. Surghwand, Kand, and Ma'zhwö, besides Spinskhar and those to the s., are visible from the Pa'lkai Pass. At the top of the Pass is Tlarai Skobai, a graveyard and holy place. The road is as far as the Ko'tal not bad, but it is not suited as a line for a highroad or railway. The country passed through is remarkable for the five almost parallel lines of hills crossed. The rocks appear to be principally limestone and trap, and in the gorge the strata is very faulty. The whole district has a wild, bare, and rocky appearance, and the hills are in places precipitous and rugged, while the valleys are broken, hilly, and covered with stones. There are no trees, and the overgrowths are scanty—grass in tufts, camelthorn, southernwood, and dwarf tamarisks. Water is scarce, and human habitations few. A few goats and cattle find grazing in the lower lands. After the La'ndai Surai Valley the country is rugged and mountainous, but beyond the Pa'lkai Pass the hills assume more the appearance of rolling down, the more noticeable points being the Peaks Tang Tor, Surtak, and Malewa. The inhabitants are principally Zakhpe'l Ka'kars.

## TENTH STAGE.

From Chimja'n to Baia'nai. 22 miles. General forward bearing, 120°. 29th March.

The road leads close under Mt. Sya'jgai, running along the bed of the river so variously named, but now called permanently the River Kach, past some low hills, called the Zhar Hills, at the foot of Mt. Sya'jgai. It is here good, direct and easy, but a little rough and stony in the river. After passing Mt. Sya'jgai 7 miles out, it runs in a s.e. direction (115°) straight across the Sho'r Valley towards the Zharuband Peak, which is reached at the 13th mile. The River Kach is crossed at the 10th mile, here a broad torrent-bed a quarter of a mile across, but giving no trouble. The road so far is fairly level and easy throughout, though stony. There are a few easy nullah-beds about Mt. Sya'jgai and the hills to be crossed. After reaching and passing the Zharuband Peak the road runs across a small valley called the Mzarai, in a more southern direction (135°), to some springs called the Mzarai Springs. It is here stony and hilly, and crosses frequent nullahs and streams, several, especially the River *Ghwazh*, have bad banks, and would, when flooded, be formidable obstacles. After the Mzarai Springs are passed the road leads over a small and easy ko'tal through the *Ghulto'i* Hills, across a hilly valley, and then over another similar ko'tal through the Mzarai Hills into the Baia'nai Valley, which it follows in an e. direction for a couple of miles, and then, by a sharp turn s. through the Baia'nai Hills, to the village of Baia'nai. After passing the Mzarai Springs the road is bad, stony, hilly and rugged, passing numberless nullah-beds. It is, in fact, a fair-weather road, and it is doubtful whether it would be practicable in bad weather. This latter part of the country is called, as a whole, the Baia'nai Pass.

The country passed is singularly barren of human life, and has a deserted appearance, there being no signs of cultivation anywhere *en route*. Water also is scarce, being obtainable only at the Pla'n, Mzarai, and Uchsaha'n Springs, but there are no villages by them. The Sho'r Valley is a wide and somewhat flat valley, about 10 miles wide, but quite bare, except of tufts of grass and camelthorn, and very stony. To the n.e. runs the Sungalu'n Valley, somewhat similar to it. In this there are two villages, Dargai and China'li (both *Zakhpe'l Ka'kar*), about which there is some cultivation. Kach, an Amakzai (Kakar) village, lies among some hills to the e. The country in the Mzarai Valley is very similar, but there is more grass there. The Mzarai, *Ghulto'i*, and Baia'nai Hills are of whitish limestone and the country through the Baia'nai Pass is wild and rugged and much cut into by nullahs, the beds of which are full of limestone chips from the hills. There is a good deal of grass in the Baia'nai Valley, also barberries, olives, camelthorn, and a few trees also about the slopes of the hills in the Sho'r Valley. There is swampy and green land about the Mzarai Springs. The glacia observed before is to be remarked in the Sho'r Valley. The peculiar feature of the country is the number of well-worn tracks and pathways met with. These are very numerous, and run in all directions, as will be seen by the maps; they give the country an appearance of having an amount of traffic over it not warranted by its sparse population. A good many are said to lead to places where wood is got in the hills. The parallel run of the hills noticed to the n. is also to be observed to the s. of the Sho'r Valley. There are fine views of the many hills surrounding the valleys from all points.

Baia'nai, 6500 feet, is a small Dumar (Kakar) mud fort and village, in a narrow secluded valley running w. to e. into the Bo'rai Valley, over which there is a fine view towards the She'rkai Peak and the Koha'r Hills. Supplies

are next to none, but water is plentiful and good. The camping-ground is spacious but stony, and its natural drainage is good. The position is somewhat dangerous for troops in an enemy's country.

#### ELEVENTH STAGE.

*Baia'nai to Ninga'nd.* 9½ miles. General forward bearing, 80°. 30th March.

The road leads nearly E. over the *Ghazgai* Valley, a rolling hilly valley, at an easy general downward gradient, and, though stony, it is good. About 2 miles out a little cultivation at a hamlet called *Ghi'rkhwa'* (Na'ozai, Ka'kar) is found, the wheat being now (spring) green, and a little beyond this the River Dargi' is crossed, a narrow stream with stony bed and steep banks. After this the road follows a hollow part of the valley in a more northerly direction, till the River Kach is again met a mile from Ninga'nd—now a wide stony river-bed some 600 yards in breadth. The left bank is rather steep, but would give no difficulty, and the river shows no signs of ever rising beyond 4 feet. The road may be called good, but a guide is necessary, as there are sudden and deep nullahs running into the River Kach from the low hills in the valley.

The country passed is somewhat open, and the overgrowths are the same as usual, but thicker, and the lower lands seem capable of easy cultivation. There are no trees except on the hill-sides. The population, Utma'n Khe'ls, is very sparse, the only village seen *en route* being Sarkai Zangal, but there are signs of there having been a thicker population formerly. Numerous pathways lead across the valley to the mountains on either side, said to be used by shepherds only. Cattle, sheep and goats are to be seen grazing; ku'ls and ka'rezes also exist. The *Ghazgai* Valley is bounded by the Samsar Hills to the s., and the Naraighbarg and Koha'r to the n., behind which run the Spin *Ghwazh* Hills in a parallel direction. There is a road to Kach *viâ* the gorge of the River Kach in the Spin *Ghwazh* Hills, another to *Ghurat viâ* the Koha'r Pass, and a third to the *Zho'b* Valley eastward *viâ* Bo'rai Chap. The climate is much warmer than hitherto.

Ninga'nd, 5700 feet, is an Utma'n Khe'l village on the River Kach. Supplies are scarce, but water is plentiful and good from ku'ls. There is a large and good space for a camp, and a fine view over the Bo'rai Valley. The main feature to notice is the change in the houses. Every house is a fort in itself, and the village has, besides, a small square fort with four small towers. The houses are of mud, with thatched roofs covered over with mud, and there is a mud tower at one end. The height of the houses is about 6 feet and the towers about 12 feet.

#### TWELFTH STAGE.

*Ninga'nd to Waria'gai.* 12½ miles. General forward bearing, 119°. 31st March.

The road leads off S.E., following the direction of the River Kach through cultivated land, and is good and firm, till a swamp (probably not permanent), formed by the overflowing of a ku'l, is reached, about 3 miles out. This is avoided by going into the river-bed. From that point to Shaka're'z *viâ* Shaida'n—a burial-ground—the road runs partly through cultivated land. It is there pleasant walking in fine weather, otherwise the road is stony as usual. From Shaka're'z to old Waria'gai it is good, and from that point on it runs through cultivated land. It is easy and good throughout, and the downward gradient hardly perceptible. The cultivated ground would of course be trouble-

some in wet weather. The River Hanumba'r, a broad, stony, dry torrent-bed, is crossed after Old Waria'gai. The left bank is rather steep. The road is said to run parallel to that running from Baia'nai *viâ* Smalan and Bagha'wa to Tal.

The country passed through has lost the depopulated appearance so remarkable in the upper lands. There is extensive cultivation carried on all over the valley and alongside the rivers, and the soil appears to be good and carefully cultivated. Wheat, barley, Indian corn, and millet, are the crops grown. The Ghazgai Valley extends as far as the Waria'gai Peak, and from that point commences the Bo'rai Valley, running up in an eastern direction. The former is some 5, and the latter some 15 miles broad. About Waria'gai Fort, and within 10 miles, there is a cluster of villages; those on the River Kach being Utma'n Khe'l, and those on the River Hanumba'r Sandar Khe'l—viz., on the River Kach, Numa'ra', Jalka're'z, Shaka'rez, Ro'dli'n, Lashtai, Arbasin', Bakhma'; on the River Hanumba'r, Waria'gai, and the cluster of three called collectively Khankai, and Zangiwa'l. Further up the Bo'rai Valley are Dargai and Shabozai. The valleys, as regards vegetation, have the same appearance, but grass is more plentiful and better. The glacis about the hills is still observable, and these appear to be of limestone and very broken in strata. There are a great many fruit-trees about the villages, and willows (pollard) about the stream. Water is abundant, and through Old Waria'gai there is a gurgling brook running. Ku'ls and ka're'ze's are met with in several places. Numerous tracks run across the valleys. One from Ninga'nd goes through the Ghobargai Hills *viâ* the Dargat Springs to Sinza'wai in the Lwa'ra Valley on the Tal Road, and another from Shaka're'z *viâ* Ko't and the Sho'r Pass to Bagha'wa on the Tal route. Old Waria'gai is an A'li'zai (Sandar Khe'l, Ka'kar) village deserted 5 years ago on account of a tribal quarrel. The climate is much warmer than of late, and the season more forward. Much of the wheat and grass is green, and several of the fruit-trees in blossom, and the flowers all beginning to come out already (end of March). The inhabitants have a Belo'ch cast of feature, and are of a much less wild appearance than of late, and their houses are better; but still every house is a fort, showing an unsettled state of affairs in the country. The houses are of mud, and nearly all have towers, and generally also a courtyard in which is cultivation. The grain is stored in small towerlike mud structures on low piles.

Waria'gai, 4900 feet, is a small village near the Waria'gai Fort, a square ruined fort of some size, with numerous towers. The cluster of villages called Khankai is also close by, so that supplies could be made plentiful. The camping-ground, though spacious, is on cultivated fields.

#### THIRTEENTH STAGE.

*Waria'gai to Sharan.* 16 miles. General forward bearing, 90°. 1st April.

The road runs along the Bo'rai Valley in a generally due E. direction, partly through cultivated land, and partly along the glacis of the Tor Khaize' Hills, and is there stony, otherwise it is pleasant and easy. About the beds of the Rivers Tor Khaize', Ba'h, and Lo'rai, the ground is somewhat broken. Besides these streams several nullah-heads have to be crossed, giving a little trouble, and also numerous ku'ls, which are troublesome to camels. There is a slight ascent for the first 5 miles, but after that a steady descent all the way. Near the village of Navgivya'la, the River Lorai has steep and nasty banks and a narrow bed. The country passed through is the Bo'rai Valley, which is from 8 to 10 miles wide, running in an easterly direction, bounded by the Spin, Waha'r, and Ku'ru' Hills to the S., and Waria'gai, Tor Khaize and Mu'r Hills to the N. It is full of villages of the Sandar Khe'l Ka'kars,

some of which are large and prosperous, such as Dargai and Shabozai, and is extensively cultivated. Fruit-trees are very numerous, and water is plentiful everywhere. In the uncultivated parts there is a quantity of Du'b grass in places, and camelthorn and southernwood are abundant; dandelions also are to be seen in quantities, but, except where planted, trees are, as usual, absent. Parts of the valley show signs of water-scour, and in places the ground is somewhat cut up by nullahs. On the whole, however, it is the most prosperous part of Afghanistan I have yet seen. The villages are collections of well-built fortified houses of considerable size, and extend over a large extent of ground. Orchards are to be seen round each, and in some places large trees, and at this time of year (April), when the wheat is green, the villages look really pretty. There is an air of substantial comfort and prosperity about them not often seen in the East. The inhabitants seem well off and contented, and supplies are as much as could be wished for. The cultivation is carefully carried on, the fields being allowed to lie fallow for some years in their turn, the land being carefully ploughed and the seed put in in drills; and I saw a kúl carried under the bed of the River 'Tor Khaize' by a syphon, showing considerable skill in construction. A road leads through the 'Tor Khaize' Pass, *viâ* the Churma Springs, through the Awazai (Ka'kars) and Aktarazai (Ka'kars) country to the Zho'b Valley, and two roads up the valley to the Mu'sa Khe'l country, that to the n. *viâ* the Me'nd Pass, reached in four marches, and that to the s., *viâ* the Tala'o Pass to Ba'za'r, in four marches. This last road is said to lead to De'ra Gha'zi' Kha'n, in eight marches. Both these roads are said to be bad. A road leads s. through the Hanumba'r Pass to the Lu'ni Khe'l country, and thence to Tal, in three marches. This valley was the scene of one of Na'dir Sha'h's expeditions; and he has left behind him a fort called Shahr-i-Na'dir, in the middle of the valley near Sharan, on an artificial mound, on the same principle as that at Quetta. It is of some size. Small pieces of good foreign pottery are to be found in quantities all over the valley, which are said to be also relics of Na'dir's occupation. A house in the Bo'rai Valley is a fortified structure, surrounded by a wall about 12 feet high, and covers about an acre of ground. There are usually several towers to it, and one door. Within the outer walls are generally a quantity of trees, and the house probably contains a whole family. At any rate there are a quantity of people in each house. Generally also there is a low 3-feet wall, extending round the fields, belonging to the house. Three or four such houses frequently constitute a village.

Sharan, 4300 feet, is a Bo'rai village of the usual type, but not large. It is, however, close to a large cluster of other villages, of which there are a great number in the valley, 27 being counted from a small hill near Sharan. Supplies of all sorts are abundant, and prices are fairly cheap, and the people willing to sell. Water is good and plentiful. Camping-grounds are in cultivated lands, but spacious.

#### FOURTEENTH STAGE.

*Sharan to Hanumba'r Pass.* 12 miles. General forward bearing, 129°. 2nd April.

The road runs across flat putt\* for some distance, to China' Ko't, going close under the fort. It then runs in a s.e. direction, past Waha'r and Naigwa'l, as far as the hills forming the Hanumba'r Pass, which are reached

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\* Putt is hard sun-dried mud found in all the lower lands about Central India, or wherever the sun beats with great force. These lands are generally swamps in rainy weather.

in about 9 miles, and after the pass is entered it follows the beds of the several rivers joining there, taking a turn southwards to the camping-ground, which is in the middle of the pass. This road goes through various kinds of ground: putt, cultivation, and rough, stony, water-worn places. Several ku'ls and ka're'zes are met *en route*; and the beds of the Rivers Si'a'b, Marai, Siha'n, and Lo'ralai are crossed, or followed for some distance. The Si'a'b has much broken ground about it, and bad banks; the Marai has signs about it of being a violent torrent at times, running with a broad bed over conglomerate, but its banks are easy. The Siha'n has a broad stony bed, and the Lo'ralai, into which the other three run, has a bed about half-a-mile wide. There is a considerable stream, nearly knee-deep in the Rivers Siha'n and Loralai, but that of the other streams is insignificant. From the above description it will be seen that this road, though a good and pleasant one in fine, might easily become bad, if not impracticable, in bad, weather. The country passed through as far as the pass is the same as that of the previous stage, prosperous and populous. In the pass it is wild and hilly, and much the same as in other similar parts of Afghanistan. About the rivers, rushes, tall coarse grass and Du'b grass, in large quantities, tamarisks, willows, and plum (Be'r) trees are plentiful, and stunted trees grow in patches along the slopes of the Gadiwa'r Hills. The Hanumba'r Pass is a flat open passage, about a mile wide, between the Gadiwa'r Hills and the Ku'ru' Peak, following the line of the River Lo'ralai; general forward bearing,  $170^{\circ}$ . It is the boundary line of the Sandar Khe'l and the Lu'ni Khe'l. Chips of pottery are found throughout the valley and the pass, due either to the former passage of Ka'filas\* this way, or to Na'dir Sha'h's occupation, as the inhabitants say. Roads run through the pass and near its entrance to Me'khtar (E.), which is reached in two marches. Me'khtar is a point passed at present by Ka'filas. The climate is much hotter than hitherto, and the presence of putt points to a considerable summer heat. Sport, which is fairly good along the route, is especially good in the Hanumba'r Pass. A boar was killed by the cavalry of the advanced guard on the march, and a hare was captured in the encamping-ground.

Hanumba'r Pass; merely an encamping-ground by the River Lo'ralai. The ground is stony, but of large size. Water, grass, and firewood are good and plentiful. No supplies. There is a view s. through the pass, over some low hills on to the hills in the Marri (Belo'ch) country.

#### FIFTEENTH STAGE.

*Hanumba'r Pass to Trikh Kuram Pass.*  $18\frac{1}{2}$  miles. General forward bearing,  $121^{\circ}$ . 4th April.

The road runs along the River Lo'ralai, through wooded land for about 4 miles, and is easy on the whole. It is, however, broken in places, and some torrent-beds have to be crossed; and it would be very easy to lose the road without a guide. After this the road runs through an open plain, called the Sarghar Valley, for about 10 miles. It is here easy and good, being on hard putt most of the way. A river-bed, the River La'ki', with steepish banks and sandy bottom, is crossed about 8 miles out. After this the Tumbe'l Hills are entered, and the road then becomes stony, hilly, and bad, frequently crossing nullah-beds, some of which have steep banks and deep beds, and there is much broken ground about. The passage through, or rather over, the hills is known as the Trikh Kuram Pass, and the general ascent up it is consider-

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\* Called usually, in English, caravans.



able. The road is, as at present used, essentially a fair-weather road, but so far there seems no reason why a good one should not be made. The advantage is that some 40 miles towards Vata'kri are saved by it. The disadvantage is the want of water, but this want could be remedied by digging wells, water being easily obtained at no great depth in many places.

The country passed through varies considerably: at first it is forest-land, the trees being thick and close, mostly Be'r and Ba'bul. There is no cultivation or habitation now, but there are abundant signs of a former population. When the forest is passed, a flat grassy valley, known as the Sarghar Valley, is met, running in a general direction s.w., open at the w. end towards the Lu'ni Valley and Tal, and closed up apparently at the eastern. In the lower lands there is a fairly thick tamarisk jungle. The River Lo'ralai takes a sharp turn to the w., about 5 miles out, and, after it is left, there is no water for nearly 15 miles, till the Trikh Kuram Springs are met, in the Tumbe'l Hills. Villages of the Lu'ni Khe'l (Patha'ns, but not Ka'kars, and claiming to be Dura'nis) are visible along the River Lo'ralai to the w., but no sign of present habitation is seen *en route*. Abundant signs of a former population are seen everywhere in ruined villages, one of which, Paind Kha'n Ko't, is still in good preservation. Former cultivation is visible in many places. It is said local wars are the cause of the depopulation. The land nominally belongs to the Lu'ni Khe'l, but the country is really debatable land. After the Tumbe'l Hills are entered, the country is wild and hilly, but grassy and fairly wooded. Be'r, Ba'bul, tamarisk and, a new feature, dwarf-palms, in quantities. There is no sign of human habitation in these hills. The Lu'ni Valley to the w. is thickly populated, and there are broad well-defined tracks leading n.e. towards Viho'va, and thence to India. A noticeable point, as indicative of a change of climate, are the enormous number of flies found.

Trikh Kuram Pass, 4100 feet. A camping-ground in the Tumbe'l Hills by some water. It is a hilly and irregular place, surrounded by hills of some height, and is not a desirable situation for a military camp, on the whole. There are no supplies; wood and grass are plentiful.

#### SIXTEENTH STAGE.

*Trikh Kuram Pass to Tsamaulang.* 16 miles. General forward bearing, 124°. 5th April.

The road on leaving camp runs in a s.e. direction for about a mile, when it runs e. as far as the Ko'tal of the Trikh Kuram Pass, which is passed in about 4 miles. It is here a good deal broken, and partly follows the bed of a mountain-torrent. The pass itself is about 2 miles long, and the country in it is broken and hilly. After the De'rama Valley is reached, a fairly open upland plateau, but much intersected by stream-beds; the road, as it stands, is not good, but is capable of being easily made so, part of it running across fairly flat putt. At 9½ miles a graveyard, called Chartanak, is reached, and another valley, the Kutsa. The road here is fair, but streams, with bad banks, are crossed. At 13 miles a low Ko'tal, the Jarai Tang Pass, is crossed. Here the road is very bad and rocky, but the pass can be easily turned by following the River Kutsa. For the next 2 miles the ground is rough and bad, and a stream with nasty banks, the River Jarai, is crossed. After this the road runs s. along the Tsamaulang Valley, on putt, the camp being reached in 16 miles across the River Tsamaulang, which has a stony bottom, but bad sandy banks. The road as it stands is a bad one, but does not present any engineering difficulties at any part. There is no water for 11 miles, but after that, water is plentiful and good, being found in deep pools in the river-beds.

As far as the Ko'tal of the Trikh Kuram Pass the country is, as before described in the pass itself, wild, hilly, and much broken, but fairly open. It is fairly wooded, and camelthorn is abundant. Grass is plentiful throughout the march, and in places it is thick and rank. The De'rama Valley is an open, fairly flat, grassy upland plain, some 5 miles long by as many broad. It is thinly wooded. In the Kutsa Valley the trees are thicker, especially the dwarf palms, and in this and the Tsamaulang Valley wild asparagus abounds. The Tsamaulang Valley has much the appearance of the last, except about the Jarai Tang Pass, where it is stony, broken, and covered with boulders. The grass in it is especially thick, and there are many tamarisks. It is about 7 miles wide, and appears to be 40 miles or so long. Hilly as the country is, there is but one prominent hill, the Dadar Peak. It is entirely uninhabited, but is claimed by the Lu'nis, who graze it. Wild animals seem to be absent, but I found some porcupine-quills in the Kutsa Valley. Three roads lead to Bagha'o, from the Tsamaulang Valley. One due e. over the Kharla'k Range, which is said to be bad, another turns the range northwards, but is said to be waterless, while the third turns it to the south, *viâ* the Gurmu'n Hills. This is said to be a good road. A road leads over the Turwa'l Hills, s.w., *viâ* the Tang Pass to Tal, but it is a mere sheep-track.

Tsamaulang, 4000 feet, is a camping-ground, by the river. Water, grass, and wood plentiful; the ground is spacious. No supplies. There is some danger of fire when the long grass of the valley is dry.

#### SEVENTEENTH STAGE.

*Tsamaulang to Ba'la' Dha'ka.* 11 miles. General forward bearing, 178°. 6th April.

The road runs along the Tsamaulang Valley for a couple of miles, during which, as before, it is over level putt, but passes some broken ground about a torrent-bed, about 1½ mile out. For the next 2 miles it runs through the low hills at the s. end of the valley, and is there hilly and uneven, but not bad, except as regards nullahs, which are numerous and deep. The road then enters the Hanokai Hills, following the gorge of the River Hanokai for a mile, during which it is broken, winding and narrow, crossing the river frequently, which has high soft reedy banks. The gorge is narrow, and the sides precipitous. The road here, as now used, is bad, but is capable of being made good, especially if a bridge were thrown across the gorge at the worst point. After this the gorge widens to about half-a-mile, and the road is at first fair, but crosses some bad nullahs. The gorge then becomes very wild, and full of conical hills, amid which the road winds at a considerable upward gradient, culminating in a sharp ascent, after which it is lumpy and uneven, and very bad and trying to camels. A nullah, with soft precipitous banks 15 feet deep, follows the road to the right. The Ko'tal of this pass, the Hanokai, is reached in 6½ miles, at which point there is a small grassy plain, the descent from which, down the Jurnai Pass, is very bad and lumpy. After this the Jurnai Valley is crossed, the road running more easily over uneven, hilly, ground, and following the Ka'han Pass, where it is hilly, stony, and narrow. After this it takes a sharp turn to n.e., along the Ba'la' Dha'ka Valley to the camping-ground, where it is easy and good. The road, on the whole, as used now, is very bad, but could be made practicable and easy for ordinary weather in about two days or so. The country in the Tsamaulang Valley is much as before, over a grassy fairly wooded plain, and the low hills at the s. end of it are grassy and fairly wooded, but stony in places. The country in the passes is very broken and wild, but grass, some of it coarse and reedy, southernwood,

and tamarisk, are abundant. These are, in fact, abundant throughout the district, which appears to be a series of narrow parallel valleys, having much the same appearance as the Tsamaulung. There are no inhabitants, and no signs of population, but the roadways are well-defined. Any quantity of tertiary fossils (sea-fish, &c.) are found in the Jurnai Hills. The water in the River Hanokai is salt and undrinkable, and there is no more till the River Ka'han, where it is good and abundant. A road leads over the Turwa'l Hills, by a bad pass, called the Tang, to Tal, and another from the Hanokai Pass to Bagha'o. When the Ba'la' Dha'ka Valley is reached, the main road from Tal and Cho'tia'li into Ba'rkho'm, *via* the Han Pass, is joined.

Ba'la' Dha'ka, 4100 feet, is a burial-ground in the valley, and the usual encampment. Grass, wood, and water are abundant. No supplies. As on the Tsamaulung ground, care must be taken to protect the camp against fire. The ground is spacious and flat.

#### EIGHTEENTH STAGE.

*Ba'la' Dha'ka to Mitthi' Khu'i'n.* 16 miles. General forward bearing, 144°. 7th April.

The road at first follows the Ba'la' Dha'ka Valley, and is there easy; it then runs through high rolling hills, with deep ravines, but is still easy on the whole, though a little broken in places. At 4 miles the Ba'la' Dha'ki' Pass is entered, and here the ground is very broken, and the roadway narrow, following a stream with high reedy banks, but having a sandy, easy bed. The width of the pass is variable, from 10 yards to fairly open spaces. At the 5th mile the ascent is severe, over a somewhat open and hilly Ko'tal, but the roadway is not difficult. From this point the descent is sharp, and the road very rugged and stony. The road then runs over the Paste' Valley, an upland plain, flatter than usual. Here it is easy. At 8 miles, after running easily over a hilly country for a mile, the Ko'tal of the Han Pass (properly the Hankai Pass, but known geographically as the Han Pass) is reached. The descent is sharp, over very broken country, and the road is narrow, very stony, and uneven, but not so bad as the country passed through would make one conjecture it to be. At 10 miles there is a very severe zigzag descent, after which the road follows and frequently crosses the River Han, which is very narrow in places, but makes an easy roadway on the whole. At 13 miles the entrance to the pass is reached, and the Hankai Valley crossed, along which the road is hilly, but easy, crossing the River Han, now a tolerable torrent-bed, generally quite dry, with steep and sandy, but not difficult, banks. At 14 miles a very narrow ravine, the Cho'r Tarap, is passed. It is about 10 to 50 feet wide, and about 200 yards long, the river having apparently cut its way sheer through a limestone hill. At 16 miles the camping-ground is reached, at the entrance to the Hankai Valley. The natural road over the pass is not difficult, considering the country, and is capable of being easily made good and practicable. The steep ascent from the Ba'rkho'm side would always be an obstacle, but the chief difficulty, want of water, could apparently be remedied in many places by digging, without much trouble.

The country in Ba'la' Dha'ka is grassy and hilly, but, excepting barberry bushes, other vegetation is scarce. In the Ba'la' Dha'ki' Pass the hills are rocky and precipitous in places, but grass is abundant in the less steep places. The whole of the country seems to be of limestone formation (tertiary), and the hills may be described as consisting of one mass of fossil shells. The Paste' Valley is grassy, but trees are sparse. The Han (or Hankai) Pass runs through a very wild, lumpy, broken, country, somewhat bare of vegetation,

but in the lower part trees of the usual type are abundant. The Hankai Valley is a grassy valley, fairly wooded. The most remarkable feature is the Cho'r Tarap Ravine: it is a sharp cut, narrow defile in a line of hills. A similar one is visible a little distance to the w. The scenery in the pass is wild and rugged, but except Tor Tsappar Peak (called Ka'ti' Chuppri' by the Belo'chi's), there is nothing striking about it. Being debatable land it is entirely uninhabited. Patha'ns claim it as far as the N. of Tor Tsappar, and the Belo'chi's from the s. of this peak.

Mitthi' Khu'i'r, 3800 feet, is a camping-ground at the entrance of the Hankai Valley. No supplies, but the Khe'tra'n (Belo'chi') village of Hasni' Ko't is only 2 miles distant. Grass and wood are plentiful, so also is water, from a stream called Ba'bul Kha'n ka' Khu'n.

#### NINETEENTH STAGE.

*Mitthi' Khu'i'n to Luga'ri' Ba'rkha'n.* 12½ miles. General forward bearing, 210°. 8th April.

The road at first follows the River Han, now a broad, stony torrent-bed, through the gorge formed by the Tha'ndra' and Chappar Hills into the Lu'ndia'n Valley portion of Ba'rkho'm (usually called Ba'rkha'n by Europeans, and so spelt on the maps). The gorge is about 200 yards wide, and the road, though it is not difficult, is very stony. It next runs along the river-bed as far as Hasni' Ko't, a deserted village about 2 miles out, after which it runs southwards, or nearly s.w., along the middle of the valley past Da'ma'ni' Ko't, 8 miles, to Luga'ri' Ba'rkha'n, which is reached in 12½ miles. Along the plain it is easy and good in dry weather, but dusty along the putt, but would, like all putt roads, be troublesome in wet weather. A little trouble, however, would make it very easy. There is a little broken ground about Da'ma'ni' Ko't, and the River Han is crossed twice, but is an easy river.

When once the Lu'ndia'n Valley is fairly entered, a great change is observable in the country. It, like the inhabitants, becomes Belo'chi'. The glaxis so remarkable in Afghanistan disappears, and the hills stand out of a flat desert-like valley, in which the vegetation is in isolated tufts, and has the same character as that observable anywhere about the Belu'chista'n Plains. In the lower lands about Luga'ri' Ba'rkha'n there is a good deal of grass, and tamarisks are abundant. Water is abundant in the valley, some very good and plentiful water being obtained from Mahmu'd Wa'li Springs in the Ja'ndhra'n range, about 5 miles from Luga'ri' Ba'rkha'n. There is also a fair amount of good water in the River Han, and some springs near the fort at Luga'ri' Ba'rkha'n. The valley is extensively cultivated, the wheat at this time of year, April, being in ear, though still green. The season is therefore far in advance of that in Afghanistan. The general run of the Lu'ndia'n Valley is about N.E., and its breadth varies from 5 to 20 miles or so. To the N. are the Ja'ndhra'n and Jaral Hills, a fine range, under which is a lower line, the Dha'm, and to the S. the Dhaula, Ka'idhrai, and Virida' ranges, behind which towers Sha' Ko'h (or Sia'h Ko'h) in the distance. To the w. the valley is shut in the Durgara'ch and Bie'r Hills, under which are the Ka'idra', a low range, and to the E. lie the Muza'ri' Hills. The Aro'kha'n Hills lie in the valley, and Han Mina'ra' is a peculiar tower-like peak, as its name signifies. The views are somewhat fine. A road runs past the Bie'r Hills. *viâ* the Maghmara'i Valley, and over the Ma'r Pass, leading to Cho'tia'li, but the pass is a bad one. The inhabitants are Belo'chi's of various tribes, but the country seems to belong to the Khe'tra'ns, who occupy a great many villages in this district. Several of the Be'lo'ch tribes are, however, repre-

sented, and the Luga'ri's seem to claim sovereignty, their present Tumanda'r or chief, Jama'l *Kha'n*, having been born in the fort called Luga'ri Ba'rkha'n, but I could not ascertain that they owned much property in the place. Lu'nds and Isha'ni's are found in the valley itself, while Muza'ri's and Gurcha'ni's are not far off; these tribes seem to use the uplands as a summer residence. There is one Sayad village in the valley, and the Sayads have, as the Pishin Sayads appear to have, a semi-religious character.

There are signs of a much more extended population in times gone by, and the people seem to live in a very unsettled state, being harassed by the Lu'ni Patha'ns and the Marris, those pests of this part of the world, and by quarrels among themselves. Villages frequently change their sites. Old *Da'ma'ni'*, old *Khidra'ni'*, and *Hasni' Ko't* are all cases in point. This last was deserted 30 years ago, on its being harried by the Lu'nis. Everywhere over the valley are signs of former cultivation, and there was a canal at one time running near *Hasni' Ko't*. Even in January last (1879) there was a fight close by *Han Mina'ra'*, between the Lu'nis and the people of *Cha'he'n*, in which the former seem to have been victorious.

Near Luga'ri' Ba'rkha'n is *Su'ra'n*, an old Muhammadan tomb of pakka' brick and enamelled tiles (blue and white), like those at *Mu'lta'n*; and *Shar-ghala'*, near *Hasni' Ko't*, is an old deserted fort of unknown date.

A village in the Ba'rkho'm district is a square enclosure with two to four towers in a 14-foot wall, all of mud bricks. The walls are 100 yards long and upwards. The houses are all inside.

Luga'ri' Ba'rkha'n (called also locally *Bangala'*), 3100 feet, is a small fort on a low hill in the middle of the valley. Supplies from the villages round are numerous. Water is abundant. The camping-ground is spacious, but rather low and damp.

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# APPENDIX B.

TABLE of BAROMETRIC and THERMOMETRIC READINGS and REMARKS on WEATHER during the MARCH of the 2ND COLUMN TAL—CHO'TIA'LI FIELD FORCE. SPRING of 1879.

NB.—All the Readings were perforce taken in a rough and ready manner. Thermometer Fahrenheit in the shade; Barometer Aneroid.

PLACE.	Date.	Thermometric Readings.			Barometric Readings.			WEATHER.
		Max.	Min.	Mean.	Barometer.	Time of Reading.	Therm. at Time of Reading.	
Kala Abdullah Kha'n	7/3	64	38	51	24.65	3 P.M.	60	Close and cloudy.
" "	8/3	60	40	50	24.65	11 A.M.	60	Showery.
" "	9/3	48	40	44	24.70	11 A.M.	48	{ Wet with violent storms.
" "	10/3	56	30	45	24.35	9 A.M.	45	{ Showery and stormy.
Badwa'n .. ..	11/3	61	Not taken		24.60	2 P.M.	59	Cloudy.
A'li'zai .. ..	12/3	60	31	46	24.35	3 P.M.	60	{ Cloudy and showery.
" .. ..	13/3	45	22	35	24.27	11 A.M.	45	Wet
Khu'shdil Kha'n ..	14/3	{ Not taken		{ Not taken	24.40	4 P.M.	50	Fine.
" ..	15/3	54	26	39	24.40	Noon	50	{ Cloudy and Showery.
" ..	16/3	54	24	39	24.50	9 P.M.	32	Cloudy.
Sharan Ka're'z ..	17/3	54	26	40	23.80	2 P.M.	54	Fine.
" ..	18/3	58	28	42	23.80	4 P.M.	53	Fine.
Surai Pass .. ..	19/3	59	Not taken		22.80	1 P.M.	60	Fine.
Balozai Ka're'z ..	19/3	60	30	45	23.35	6 P.M.	43	Fine.
" ..	20/3	73	33	50	23.30	5 P.M.	56	Fine.
Gwa'l .. ..	21/3	70	41	50	24.00	7 P.M.	60	Cloudy.
" ..	22/3	71	38	53	24.15	7 A.M.	51	Cloudy with rain.
Ukhmughdai Pass ..	22/3	Not taken			23.40	1 P.M.	60	Cloudy.
Balozai Ka're'z ..	23/3	68	40	55	23.40	4 P.M.	60	Cloudy.
I'saf Kach .. ..	24/3	65	28	41	22.55	6 P.M.	38	{ Showery and stormy.
Ush Pass .. ..	25/3	Not taken			22.00	1 P.M.	60	Fine.
Ispira Ra'gha .. ..	25/3	60	22	40	22.30	3 P.M.	55	Fine.
Khwa'ra .. ..	26/3	61	27	44	22.25	5 P.M.	46	Showery.
Chimja'n .. ..	27/3	58	30	44	22.65	Noon	58	Showery.
" .. ..	28/3	59	39	43	22.65	6 P.M.	45	{ Cloudy with drizzle.
Baia'nai .. ..	29/3	67	33	50	23.35	5 P.M.	40	Showery.
Ninga'nd .. ..	30/3	70	40	55	24.15	3 P.M.	60	Stormy.
Waria'gai .. ..	31/3	86	36	61	24.85	2 P.M.	86	Fine.
Sharan .. ..	1/4	80	39	60	25.30	5 P.M.	67	Fine.
Handamba'r Pass ..	2/4	88	51	69	22.75	2 P.M.	86	Fine.
" .. ..	3/4	94	53	74	25.75	8 A.M.	60	Fine.
Trik' Kuram Pass ..	4/4	95	52	73	25.60	4 P.M.	76	Fine.
Tsaulang .. ..	5/4	94	49	71	25.70	6 P.M.	78	Fine.
Hanokai Pass .. ..	6/4	Not taken			24.50	Noon	95	Fine.
Ba'la' Dha'ka .. ..	6/4	95	44	69	25.50	4 P.M.	90	Fine.
Mitthi' Khn'i'n .. ..	7/4	96	52	74	25.75	7 A.M.	53	Stormy.
Luga'ri' Ba'rkha'n ..	8/4	95	51	73	26.20	6 A.M.	52	Fine.
" .. ..	9/4	86	46	66	26.25	8 A.M.	67	Fine.

# APPENDIX C.

## MEMORANDUM.

*Spelling of Place Names occurring in the Sketch Map of the March of the Tal Cho'tia'li Field Force (Spring of 1879). Compiled by LIEUT. R. C. TEMPLE, B.S.C., 1st Goorkha L.I.*

1. In the first column of the accompanying list of place names the spelling purports to be according to Dr. Hunter's modification of Sir W. Jones's system of transliteration. The Hunterian system is, however, not strictly carried out, the only diacritical marks used being those to mark the long vowels, and the "*italic*" sign to mark certain peculiarities in the consonants. The object aimed at is general intelligibility, not strict scientific spelling.

2. In the second column the words are spelt in the Persian character. Except in certain instances of well-known words, such as Muhammad, the spelling is phonetic, as the author was not able to ascertain what the local mode of spelling really is, and it should be remembered that in such a primitive country as that under consideration local names are probably never committed to paper, and so have no fixed or customary spelling. This column is merely meant as a guide to the first.

3. The third column is written according to the phonetic method of spelling usually adopted by military authorities, and is intended to help in recognizing the names of the places in other journals and records.

4. As the names found in the accompanying list are mostly new to geography, and as place names are found locally to vary greatly in pronunciation in Afghanistan, the writer wishes it to be remembered that he does not vouch for the absolute correctness of the names found in his list. They merely represent the names as they appeared to sound to him. Also the same place has frequently several names, and the name adopted in his map is the one he found to be most generally known. The writer has gone as deeply as the hurried nature of his notes will admit into this important ethnological point in his notes on the inhabitants of the districts passed through, which will be published in due course in the 'Journal of the Asiatic Society of Bengal.'

## SPELLING OF NAMES OF PLACES.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>General.</i>		
Tal .. .. .	تل	Tull
Cho'tia'li .. .. .	چوتیالی	Chotialeel
Kala Abdulla Kha'n ..	کله ابدله خان	Kulla Abdoola Khan
Kho'jak .. .. .	خوجک	Khojuck
Luga'ri Bárkha'n .. ..	لوگاری بارکھان	Loogarree Barkhan

SPELLING OF NAMES OF PLACES—*continued.*

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
1st Stage.		
Kho'jak .. .. .	خوجک	Khojuck
Ma'chka .. .. .	ماچکه	Marchka
Habi'bullah .. .. .	حبیب‌الله	Hubeebpola
Habi'bzai .. .. .	حبیب‌زای	Hubeebzye
Sha'l .. .. .	شال	Sharle
Tangai .. .. .	تنگای	Tungye
Khwa'ja Amra'n .. .. .	خواجه امران	Khwarja (Khojeh) Amran
Gwa'ja .. .. .	گواجه	Gwajja
Rahamdil Kha'n .. .. .	رهم‌دل خان	Ruhumdill Khan
Gulista'n Ka're'z .. .. .	گلستان کاریز	Goolistan Kareze
Achakzais .. .. .	اچک‌زای	Achuckzyes
Lo'ra .. .. .	لورا	Lora
Arambi .. .. .	ارمبی	Arumbee
Mi'r Kalam Kha'n .. .. .	میر قلم خان	Meer Cullum Khan
Turkhe'l .. .. .	ترخیل	Toorkhey1
Brija'n Kala .. .. .	برجان کله	Brijarne Kulla
Auli'a Kala .. .. .	اولیاء کله	Owleea Kulla



SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>1st Stage—continued.</i>		
Da'dgwal .. .. .	داد گول	Dardgwull
Badwa'n .. .. .	بدوان	Budwarne
Skan .. .. .	سکن	Scunn
Popalzai .. .. .	پوپل زاي	Populzye
Asad Kha'n .. .. .	اسد خان	Ussud Khan
To'ti .. .. .	توتي	Totee
<i>2nd Stage.</i>		
Chor .. .. .	چر	Chorr
Sayad Sa'lo .. .. .	سيد سالو	Syed Sarlo
Urumzai .. .. .	ارومزاي	Ooroomzye
Haji'zi' .. .. .	حاجيزي	Hajeezee
Sayad Paind .. .. .	سيد پيند	Syed Pyne
Sa'yads .. .. .	سيد	Syeds
Se'gai .. .. .	سيگاي	Seygye
Sha'di'zai .. .. .	شادي زاي	Shadeezye
Sha'di'zai Lo'ra .. .. .	شادي زاي لورا	Shadeezye Lora

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>2nd Stage—continued.</i>		
Pishin Lo'ra .. .. .	پشن لورا	Pisheen Lora
Haikalzai .. .. .	هیکل زای	Hyekulzye
Karbe'la .. .. .	کربله	Kurbeyla
Sha'h Da'd .. .. .	شاه داد	Shahdadd
Gangalzai .. .. .	گنگل زای	Gungulzye
To'ba .. .. .	توبه	Toba
Ka'kars .. .. .	کا کر	Kakers (Kakurs)
Sayamzai .. .. .	سیمزای	Syemzye
Ajabzai .. .. .	{ اجزای (عجیب زای) }	Ujjubzye
A'li'zai .. .. .		Alleezye
Sire' Khila .. .. .	سری قله	Sirray Khila
Gaz .. .. .	گزر	Guz
<i>3rd Stage.</i>		
Ghazni .. .. .	غزنی	Ghuznee
Madat .. .. .	مدت	Muddut
A'ta' Mohammad .. .. .	آتا محمد	Atta Mahommed

SPELLING OF NAMES OF PLACES—*continued.*

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>3rd Stage—continued.</i>		
Ka'kozai .. .. .	کاکوزاي	Kakozye
Brahamzai .. .. .	برهمزاي	Brahamzye
Sayad La'l .. .. .	سيد لال	Syed Loll
To'ghai .. .. .	توغاي	Toghye
Ma'likai .. .. .	مالکاي	Mallikye
Sopa'nzai .. .. .	سپانزاي	Soparnzye
Muzarai .. .. .	موزاي	Moozzarye
Khama'ndai .. .. .	خامنداي	Khamandye
Do'st Mohammad .. ..	دوست محمد	Dost Mahommed
Sama'lzai .. .. .	سمالزاي	Samarlzye
Spin Khila .. .. .	سپن قله	Spin Khila
Bagarzai .. .. .	بگرزاي	Baggurzye
Sayad Paiyo .. .. .	سيد پيو	Syed Pyo
Sayad Alab .. .. .	سيد الب	Syed Ullub
Ya'singzai .. .. .	ياسنگزاي	Yarngzye
She'rbat .. .. .	شيربت	Sherebutt
Ma'likya'r .. .. .	مالکيار	Marlikyar

SPELLING OF NAMES OF PLACES—*continued.*

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>3rd Stage—continued.</i>		
Sayad To'ti .. .. .	سید توتی	Syed Totee
Surkha'b .. .. .	سرخاب	Soorkhab
Zara Khila .. .. .	زره قله	Zurra Khila
Manzakai .. .. .	منزکای	Munzakye
Ka'mil Kha'n .. .. .	کامل خان	Kammil Khan
No'a Ba'za'r .. .. .	نوه بازار	Noa Bazaar
Amand Khe'ls .. .. .	امند خیا	Ummund Kheyls
Kand .. .. .	کند	Kund
Khunjagai .. .. .	خنجگای	Khoonjergye
Mehtarzai .. .. .	محترزای	Mehterzyes
Lu'r Kha'nizais .. .. .	لور خانزای	Loor Khanizyes
La'l Mohammad .. .. .	لال محمد	Loll Mahommed
Vaki'l .. .. .	وکیل	Vakeel
Ha'ji' Kha'n .. .. .	هاجی خان	Hajjee Khan
Mohammad Sa'dik .. .. .	محمد صادق	Mahommed Sardik
Dab Kha'nizai .. .. .	دب خانزای	Dubb Khanizye
Barso' .. .. .	برسو	Burso
Zho'b .. .. .	ژوب	Zob (Job)

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>3rd Stage—continued.</i>		
Shekha'lzai .. .. .	شیخالزای	Sheykhalye
Allah Da'd .. .. .	اله داه	Ulla Dad
Khu'shdil Kha'n .. .. .	خوشدل خان	Khooshdill Khan
Nu'rzaï .. .. .	نورزای	Noorzye
Kama'lzai .. .. .	کمالزای	Kamallye
Pi'l .. .. .	پیل	Peel
Zarghu'n .. .. .	زرغون	Zurghoon
Takatu' .. .. .	تکتو	Tuckatoo
Gwa'l .. .. .	گوال	Gwall
Quetta (Kwatta) .. .. .	کوتا	Quetta
Chiltan .. .. .	چلتن	Chiltan
To'r Tari'ns .. .. .	تورترین	Tor Tareens
Pishin .. .. .	پشن	Pisheen
Sha'lko't .. .. .	شالکوٹ	Shallkote
<i>4th and 5th Stages.</i>		
Sharan Ka're'z .. .. .	شرن کاریز	Shurrun Kareze
Sharan .. .. .	شرن	Shurrun
Barsho'r .. .. .	برشور	Burshore

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>4th &amp; 5th Stages—continued.</i>		
Surai .. .. .	سرائي	Soorye
Sulima'n Khe'ls .. .. .	صليمان خيل	Soolyman Kheyls
Lu'r Anga'ng .. .. .	لور انگانگ	Loor Ungong
Shargandai .. .. .	شرگنداي	Shurgundye
Ku'zanga'ng .. .. .	کوزنگانگ	Koozungong
Pinakai .. .. .	پنکاي	Pinnakye
Mohammad Shari'f .. .. .	ماحمد شريف	Mahommed Shereef
Kha'nizai Ka're'z .. .. .	خانزاي کاريز	Khanizye Kareze
Balozaï Ka're'z .. .. .	بلزاي کاريز	Bullozye Kareze
Sa'ghai .. .. .	ساغاي	Sarghye
Dof .. .. .	دف	Doff
<i>6th Stage.</i>		
Nari'n .. .. .	نرين	Nareen
Sharan .. .. .	شرن	Shurrun
Khunchagai .. .. .	خنچکاي	Khoonchagye
Ka'han .. .. .	کاهن	Kahun
Tlarai .. .. .	تلر اي	Turriel
Bargai .. .. .	برگاي	Burgye

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>6th Stage—continued.</i>		
I'sa' Khe'l .. .. .	عیثا خیل	Eessar Kheyl
Murghai .. .. .	مرغای	Moorghye
Dilsho'r.. .. .	دلشور	Dilshore
Rod .. .. .	رود	Road
Wochakla .. .. .	وچاخله	Wochukhla
Me'kla'n .. .. .	میخان	Maykhan
Shakar .. .. .	شکر	Shukkur
Ghobarga .. .. .	غبرگه	Ghoburga
Zarghu'n Ka're'z.. .. .	زرغون کاریز	Zurghoon Kareze
Kaho'i Ka're'z .. .. .	کشوی کاریز	Kahoe Kareze
Dargai .. .. .	درگای	Durgye
Gwa'l .. .. .	گوال	Gwarle (Gwall)
Wulgai .. .. .	ولگای	Woolgye
Kha'nai .. .. .	خانای	Khanye
Khu'shla'k .. .. .	خوشلاک	Khooshlark
Gurkhai .. .. .	گرخای	Goorkhye
Manzakai .. .. .	منزکای	Munzakye
Safkha'n Kala .. .. .	سفخان کله	Sufkha Kulla

SPELLING OF NAMES OF PLACES—*continued.*

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>6th Stage—continued.</i>		
Chaukul .. .. .	چوکل	Chowkool
Bo'sta'n .. .. .	بوستان	Bostan
Sado'h .. .. .	سدوه	Suddoh
Ka'sam Khila .. .. .	قاسم قله	Kassim Khila
Akhundza'da Go't .. .. .	اخواندزاده گوت	Akhoonzada Goto
Ja'fir Go't .. .. .	جعفر گوت	Jaffir Gote
Bola'n .. .. .	بولان	Bolan
Sagar .. .. .	سگر	Suggur
Mangal .. .. .	منگل	Mungul
Brahima'n .. .. .	براهمان	Brahiman
Zhawar .. .. .	ژور	Juwwar
Sagarband .. .. .	سگر بند	Suggurbund
Ukhmughdai .. .. .	اخمغدای	Ookhmooghdye
A'madu'n .. .. .	آمدون	Armadoon
Zhizha Tangai .. .. .	ژژه تنگای	Jijjatungye
Chapar (Chappar) .. .. .	چپر	Chupper
Go'gai .. .. .	گوگای	Gogye



SPELLING OF NAMES OF PLACES—*continued.*

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>6th Stage—continued.</i>		
Ro'dgai .. .. .	رودگای	Roadgye
Uzhdö .. .. .	اوژدو	Oojdoo
Tsa'ru .. .. .	تسارو	Tsarroo
Surana' .. .. .	سرنا	Sooranar
Sara'ngzais .. .. .	سرانگزای	Saraingzyes
Mullaba'ri' .. .. .	مله ناری	Moollabarree
<i>7th Stage.</i>		
De'wad .. .. .	دیون	Daywod
Pa'ni'zais .. .. .	پانیزای	Panneezyes
Ya'ghista'n .. .. .	یاغستان	Yarghistan
Sraghar .. .. .	سرغر	Sruggur
Mo'sai .. .. .	موسای	Mosye
Ko'sh Kach .. .. .	کوش کیچ	Koash Kutch
I'saf Kach .. .. .	عیشف کیچ	Eesuf Kutch
Su'r .. .. .	سور	Soor
Pi'tal .. .. .	پیتل	Peetul
Sur Kach .. .. .	سر کیچ	Soor Kutch

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
8th Stage.		
Ta'zi' Kach .. .. .	بازي کچ	Tarzee Kutch
Shnaga'l .. .. .	شنغال	Shnagall
Sara'ngzai .. .. .	سرانگزاي	Sararngzye
Mula'zai .. .. .	ملازاي	Moollarzye
Zagan Kach .. .. .	زغن کچ	Zuggun Kutch
Wari'a Kach .. .. .	وړيه کچ	Wareea Kutch
Wari'a .. .. .	وړيه	Wareea
Kuchlara .. .. .	کچلره	Koochlara
Kudi'n .. .. .	کدين	Koodeen
Shaghi'n .. .. .	شغين	Shageen
Sa'bonai .. .. .	سابناي	Sarbone
Wargai .. .. .	ورگي	Wurgye
Adak Tangai .. .. .	ادگ تنگاي	Udduck Tungye
Shudand .. .. .	شدند	Shoodund
Snaghar .. .. .	سرغر	Sruggur
Mi'r Kha's .. .. .	ميرخان	Meer Khan
Ka'rum .. .. .	کارم	Karroom

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
8th Stage—continued.		
Ush .. .. .	آش	Oosh
Mo'mand Sara'i' .. .. .	مومند سراي	Mohmund Sarace
Surghwand .. .. .	سرغوند	Soorghwund
Che'sha'n .. .. .	چيشان	Cheyshan
Trikhada'gh .. .. .	ترخداغ	Trikhadargh
Ikhbarg .. .. .	اخبارگ	Ikhburg
Lo'ghan .. .. .	لوغن	Logun
Ispira Ra'gha .. .. .	اسپره راغه	Ispirra Ragha
Ma'zhwō .. .. .	ماژوو	Majwer
To'pobargh .. .. .	توپورغ	Topoburg
Mo'mand .. .. .	مومند	Mohmund
Nangalu'na .. .. .	ننگلونه	Nungaloona
Shpe'zhandai .. .. .	سپزنداي	Shpayjundye
Ra'di'ngzai .. .. .	رادنگزاي	Raddingzye
Spinskhar .. .. .	سپنساخر	Spinskhour

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>9th Stage.</i>		
Nasrat .. .. .	نسرت	Nusrut
O'bushtkai .. .. .	اوبشتکاي	Oabooshtkye (Obuski)
Surlo' .. .. .	سرلو	Soorlo
Khargai .. .. .	خرگاي	Khurgye
Khwa'ra .. .. .	جواره	Khwarra
Ghobargai .. .. .	غبرگاي	Ghoburgye
Zakhpe'ls .. .. .	زخپيل	Zukhpeyls
<i>10th Stage.</i>		
Hindu Ba'gh .. .. .	هندو باغ	Hindoo Bagh
Warghas .. .. .	ورغس	Wurguss
Tang To'r .. .. .	تنگ تور	Tung Tor
Male'wa .. .. .	مليو	Malliwa
Surtak .. .. .	سرتک	Soortukk
Tlarai Skobai .. .. .	تلر اي سکبای	Tlarye Scobyte
Pa'lkai .. .. .	پالکاي	Polkye
Mali'v Tarkai .. .. .	مليو ترکاي	Maleeve Turkye
La'ndai Surai .. .. .	لاندی سرای	Larndye Soorye
Surmastalli .. .. .	سرمستيلي	Soormustylee

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
10th Stage—continued.		
Tu'r Tangai .. .. .	تور تنگاي	Toor Tungye
Pla'nzhara .. .. .	پلنژرد	Plarnjara
Spi'r Tangai .. .. .	سپير تنگاي	Speer Tungye
Churmai .. .. .	چرماي	Choorma
Walto'i .. .. .	ولتوي	Woltowy
Ghwand .. .. .	غوند	Gwund
Khwai .. .. .	خوای	Khwe
Gundamarai .. .. .	گندمرای	Goondamarye
Tarakai .. .. .	ترکاي	Turrakye
Zwaisha .. .. .	زوايش	Zwysha
Chimja'n Ghar .. .. .	چمجان غر	Chimjann Ghar
Zaghlu'n .. .. .	زغاون	Zughloon
Zharpitau .. .. .	زرپتاو	Jurpito v
Ba'shai .. .. .	باشاي	Barshye
Dargai .. .. .	درگاي	Durgye
Chimja'n .. .. .	چمجان	Chimjaun
Sya'jgai .. .. .	سیاجگاي	Syarjgye

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>10th Stage—continued.</i>		
Sa'la'zh .. .. .	سالژ	Sallarj
Sho'r .. .. .	شور	Shore
Na'via't.. .. .	ناویات	Navviart
Gurmai .. .. .	گرمای	Goormye
Kurbi' .. .. .	کربی	Koorbee
Matkhilar .. .. .	متخلر	Mutkhilurr
Zhar .. .. .	ژر	Jurr
<i>11th Stage.</i>		
Dargai .. .. .	درگای	Durgye
Sungalu'n .. .. .	سنگلون	Soongaloon
Sungalu'n Ghar .. .. .	سنگلون غر	Soongaloon Ghur
China'li .. .. .	چنالی	Chinallee
Pla'n .. .. .	پلان	Plarne
Tang Ghar .. .. .	تنگ غر	Tung Ghur
Kach .. .. .	کیچ	Kutch
La'ndai .. .. .	لندای	Larndye
Kwo'i .. .. .	کوی	Kwowy

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>11th Stage—continued.</i>		
Ka'sai .. .. .	کاساي	Kassye
She'ri'n .. .. .	شيرين	Sherreen
Khu'ni .. .. .	خوني	Khoonee
Mzarai .. .. .	مزراي	Mzurrye
Zharuband .. .. .	ژربند	Jurroobund
Utma'n Khe'ls .. .. .	آتمان خيل	Ootman Kheyls
Baia'nai .. .. .	بياناى	Byannye (Biani)
Ghulto'i .. .. .	غلتوي	Gooltowy
Uchsaha'n .. .. .	آچسهان	Oochsaharne
Ghwazh .. .. .	غوژ	Gwuji
<i>12th Stage.</i>		
Spin Ghwazh .. .. .	سپن غوژ	Spin Gwuji
Naraighbarg .. .. .	نراي غبرگ	Nurryghburg
Koha'r .. .. .	کوهار	Kohar
Saikai Zangal .. .. .	سرکاي زنگل	Surkye Zungul
Dargi' .. .. .	دوگي	Durgee

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>12th Stage—continued.</i>		
Ninga'nd .. .. .	ننگاند	Ningand
Sapurai .. .. .	سپرای	Suppoorye
Ghazgai .. .. .	غزگای	Guzgye
Ghi'rkha' .. .. .	غیرخوا	Geerkwar
Samsar .. .. .	سومسر	Sumsur
Shablakh .. .. .	شبلخ	Shubblukh
Ghobargai .. .. .	غبرگای	Ghoburgye
<i>13th Stage.</i>		
Ghu'rat .. .. .	غرت	Ghoorrut
Bo'rai Chap .. .. .	بورای چپ	Bori Chup
She'rkai .. .. .	شیرکای	Sherrkye
Shaida'n .. .. .	شیدان	Shydann
Jalka're'z .. .. .	جلکاریز	Julkareze
Waria'gai .. .. .	وژیاگای	Wurriargye
Khankai .. .. .	خنکای	Khunkye
Bakhma' .. .. .	بخما	Bukhmar
Arbasi'n .. .. .	اربسین	Urbaseen



SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
13th Stage—continued.		
Ro'dli'n .. .. .	رودلین	Roadleen
Lashtai .. .. .	لشتای	Lushtye
Shaka'rez .. .. .	شکاریز	Shukkareze
Hanuba'r .. .. .	هنبار	Hunnoobar
Numa'ra' .. .. .	نمارا	Noomarra
Dargat .. .. .	درگت	Durgutt
Sho'r .. .. .	سور	Shore
Singa'wai .. .. .	سنگاواي	Singarwye
Smalan .. .. .	سملن	Smullun
Lwa'ra .. .. .	لوارا	Lwarra
Ko't .. .. .	کوت	Kote
Shaka're'z .. .. .	شکاریز	Shukkareze
Bagha'wa .. .. .	بغاوه	Bagharwa
Dumars .. .. .	دومر	Doommers
Wangai .. .. .	ونگای	Wungye
Shinle'z .. .. .	شنلیز	Shinleyze

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
14th Stage.		
Aktarzais .. .. .	اکترزاي	Ukturzyes
Churma .. .. .	چرمه	Choorma
Awazais .. .. .	اوزاي	Uwazyes
To'r Khaize' .. .. .	تور خيزي	Tor Khyzay
Zangiwa'l .. .. .	زنگيوال	Zungiwall
Cha'gai .. .. .	چاگاي	Chargye
Bo'rai .. .. .	بوراي	Bori
Sandar Khe'ls .. .. .	سندر خيل	Sunder Kheyls
Sagar .. .. .	سگر	Suggur
Spin .. .. .	سپن	Spin
Dargai .. .. .	درگاي	Durgye
Navgivya'la .. .. .	نوگيوياله	Nuvgivyalla
Ba'h .. .. .	باه	Bar
La'ho'r .. .. .	لهور	Lahore
Multat .. .. .	مولت	Mooltutt
Lo'rai .. .. .	لوژاي	Lorye
Di'lai .. .. .	ديلاي	Deelye

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>14th Stage—continued.</i>		
Shabozai .. .. .	شبو زاي	Shubbozye
Shahr-i-Na'dir .. .. .	شهر نادر	Shuhr-i-Narder
Sharan .. .. .	شرن	Shurrnn
Barminai .. .. .	برميناي	Burminye
Dalo'r .. .. .	دلور	Dalore
Sarghar .. .. .	سرغر	Surghur
Wuha'r .. .. .	وهار	Wahar
Sa'gai .. .. .	سا گاي	Sargye
Sia'b .. .. .	سياب	Siabb
Kuzarai .. .. .	کوزاي	Koozzarye
Tugarai .. .. .	تگرای	Tooggarye
Ko'wandai .. .. .	کوندای	Kowundye
Kushkai .. .. .	کشکاي	Kooshkye
Kuchnai Mu'r .. .. .	کچنای موڑ	Koochnye Moor
Lo'we Mu'r .. .. .	لووي موڑ	Loway Moor
Mu'r .. .. .	موڑ	Moor
Mu'sa Khe'l .. .. .	موسه خيل	Moossa Kheyl
Me'nd .. .. .	ميند	Maynd

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
15th Stage.		
Mara .. .. .	مره	Murra
Sha'ba'n .. .. .	شابان	Sharban
Sarka're'z .. .. .	سرکاریز	Surkareze
Marai .. .. .	مترای	Murrye
Sharan Ka're'z .. .. .	شرن کاریز	Shurrun Kareze
Kach .. .. .	کچ	Kutch
China' Ko't.. .. .	چنا کوت	Chinar Kote
Chi'nai .. .. .	چینای	Cheenyee
Navgivya'la .. .. .	نوگویاله	Navgivyalla
Kana' .. .. .	کنا	Kanar
Sagharai .. .. .	سغرای	Suggarye
Kachai .. .. .	کچای	Kutchye
Lo'waha'r .. .. .	لوهار	Lowahar
Naigwa'l .. .. .	نیگوال	Nygwall
Kaun Wahar .. .. .	کون وهار	Kown Wahar
Ba'za'r .. .. .	بازار	Bazaar
Ta'la'o .. .. .	تالاو	Tarlow
Me'khtar .. .. .	میختر	Maykhtar

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
15th Stage—continued.		
Siha'n .. .. .	سہان	Siharn
To'ra .. .. .	تورہ	Tora
Sapurai .. .. .	سپرای	Suppoorye
Hanumba'r .. .. .	ہننبار	Hunnoombar
Ku'ru' .. .. .	کورو	Kooroo
Gadiwa'r .. .. .	گڈوار	Guddiwar
Mutwarkh .. .. .	متورخ	Mootwurkh
Sarghar .. .. .	سرغر	Surghur
Lu'ni Khe'ls .. .. .	لونی خیل	Loonee Kheyls
Lo'ralai .. .. .	لورالی	Loralye
Bagharai .. .. .	بغرای	Buggarye
Lu'ni .. .. .	لونی	Loonee
Sarghar .. .. .	سرغر	Surghur
Paind Kha'n Ko't .. ..	پیند خان کوٹ	Pynd Khan Koto
Samandar Kha'n .. ..	سمندر خان	Sumundur Khan
La'ki' .. .. .	لاکی	Lakkee
Lashkar Kha'n .. .. .	لشکر خان	Lushker Khan
Spe'raghar .. .. .	سپیرغر	Speyragher

SPELLING OF NAMES OF PLACES—*continued.*

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
15th Stage— <i>continued.</i>		
Nu'r Kha'n .. .. .	نور خان	Noor Khan
Shau'gwal .. .. .	شوگول	Showgwull
Alab .. .. .	الب (علب)	Ullub
Misri' .. .. .	مصري	Misree
Saragi' .. .. .	سراگي	Saraggee
Soba't .. .. .	سبات	Sobarte
Chi'nai .. .. .	چيناي	Cheenye
Spin Tari'ns .. .. .	سپن ترين	Spin Tareens (Spentereens)
Tal .. .. .	تل	Tull
Cho'tia'li .. .. .	چوتياي	Chotiallee
Ko lu .. .. .	کولو	Koloo
Zarkha'ns .. .. .	زرخان	Zurkhans
Marris .. .. .	مري	Murrees
Ra'ha .. .. .	را -	Raha
Kowa't .. .. .	کوات	Kowarte
Viho'va .. .. .	وهووا	Vihova
Bagha'o .. .. .	بغاؤ	Baghao

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
15th Stage—continued.		
Trikh Kuram .. ..	ترخ کرم	Trikh Koorum
Tumbe'l .. ..	تمبیل	Toombeyl
16th Stage.		
La'kai .. ..	لاکای	Lakkye
Dadar .. ..	ددر	Duddur
Ba'ghu Tor .. ..	باغو تور	Barghoo Tor
Chartanak .. ..	چرتنگ	Churtanukk
De'rama .. ..	دیرمه	Deyrama
Kutsa .. ..	کتسه	Kootsa
Tsa'han .. ..	تساهن	Tsarhun
La'k .. ..	لاک	Lark
Tsamaulang .. ..	تسماولنگ	{Tsamowlung (Samalang Chimalang)
Jarai .. ..	جرای	Jurrye
Jarai Tang .. ..	جرای تنگ	Jurrye Tung
Turwa'l .. ..	تروال	Toorwall
Tang .. ..	تنگ	Tung
Kharla'k .. ..	خرلاک	Khurlark

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>17th Stage.</i>		
Oghbarg .. .. .	اُغبرگ	Oghburg
Gurmu'n .. .. .	گرمون	Goormoon
Bagha'o .. .. .	بغاؤ	Baghao
Hanokai .. .. .	هنوکاي	Hunnokye
Sha'kia'n .. .. .	شاکيان	Shakkyan
Narwa'l.. .. .	نروال	Nurwal
Jurnai .. .. .	جرناي	Joornye
Brahamzai Khela't .. ..	برهمزاي قلعٔ	Brahumzye Khelat
Pa'rai .. .. .	پاڑاي	Parrye
Ba'hand Kund .. .. .	باهن کند	Bahun Koond
Ka'han .. .. .	کاهن	Kahun
Ba'la' Dha'ka' .. .. .	بالا دُهاکا	Balla Dhakka
Barbu'z .. .. .	بربوز	Burbooze
<i>18th Stage.</i>		
Ba'la' Dha'ki' .. .. .	بالِي دُهاکي	Balli Dhakkee
Lowa'rki' .. .. .	لووارکي	Lowarkee
Paste' .. .. .	پستي	Pustay



SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>18th Stage—continued.</i>		
Tor Tsappar .. ..	تور تسپر	Tor Tsupper
Han .. ..	هن	Hunn
Hankai .. ..	هنکاي	Hunkye
Ma'r .. ..	ماڑ	Mar
Chor Tarap .. ..	چور ترپ	Chor Turrup
Chappar .. ..	چپر	Chuppur
Tha'ndra' .. ..	تهاندرا	Thanndra
Mitthi' Khu'i'n .. ..	مٲٲهي كهوين	Mitthee Khooeen
<i>19th Stage.</i>		
Han Mina'ra' .. ..	هن منارا	Hunn Minarra
Hasni' Ko't .. ..	هسني کوت	Husnee Kote
Gurcha'nis .. ..	گرچاني	Goorchannees
Belo'chis .. ..	بلوچي	Beloochees
Muza'ris .. ..	مزاري	Muzarrees
Muza'ra .. ..	مزاره	Moozarra
Sharbi'ni .. ..	سربيني	Shurbeenee
Da'ku .. ..	داکو	Dakkoo

## SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>19th Stage—continued.</i>		
Ga'ranki'n .. .. .	گارنکین	Garrunkeen
Jala'ba'ni .. .. .	جالبانی	Jullarbannee
Dhau'la' .. .. .	دهولا	Dhowla
Kaldhrai .. .. .	کلدهرای	Kuldhyre
Sharghala .. .. .	سرغله	Surghala
Chu'harda' Ko't .. .. .	چوهردا کوت	Choohurda Kote
I'sha'ni's .. .. .	عیشانی	Eeshannees
Cha'he'n .. .. .	چاهین	Chahenn
Aro'kha'n .. .. .	اروخان	Arokhan
Miharba'n .. .. .	مهربان	Mihurbann
Sha'do .. .. .	شادو	Shaddo
Ahi'mra'd .. .. .	اهمران	Aheemradd
Su'mi's .. .. .	شومی	Soomees
Ja'ndra' .. .. .	جاندران	Janndra
Na'har Ko't .. .. .	ناهر کوت	Nahur Kote
Na'hars .. .. .	ناهر	Nahur
Na'ndha' .. .. .	ناندها	Nanndha
Lotma' .. .. .	لوتما	Lotma

SPELLING OF NAMES OF PLACES—continued.

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
19th Stage—continued.		
Khidra'ni' .. .. .	کهدرانی	Khidrannee
Da'ma'ni' Ko't .. .. .	دامانی کوت	Dammannee Kote
Da'ma'ni's .. .. .	دامانی	Dammannees
Mahmu'd Wa'li' .. .. .	محمود والی	Mahmood Wallee
Dha'm .. .. .	دهام	Dhamm
Ja'ndhra'n .. .. .	جاندهران	Janndhrann
Jaral .. .. .	جرل	Jurrul
Sayad .. .. .	سید	Syed
Lu'ndia'n .. .. .	لوندیان	Loondean
Lu'nds .. .. .	لوند	Loonds
Lu'ga'ri' Ba'rkha'n .. .. .	لگاری بارکهان	Looggarree Barkhan
Bangala' .. .. .	بنگلا	Bungala
Bie'r .. .. .	بیتر	Byeyre
Maghmarai .. .. .	مغمزاری	Mugmarye
Virida' .. .. .	ویریدا	Virrida
Ka'ldra' .. .. .	کادرآ	Kalldra
Durgara'ch .. .. .	درگراچ	Doorgarach

SPELLING OF NAMES OF PLACES—*continued.*

HUNTERIAN.	PERSIAN.	PHONETIC (MILITARY).
<i>19th Stage—continued.</i>		
Vata'kri .. .. .	وتاكري	Vatakree
Ka'han .. .. .	كاھن	Kahun
Sha'ko'h .. .. .	شاكوہ	Shahkoh (Siakhkoh)
Ba'rkho'm .. .. .	باركھوم	Barkhom (Barkhan)
Khe'tra'ns .. .. .	كھيتران	Khetran (Kheytrann)

## APPENDIX D.

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### MEMORANDUM.

*Identification of Old Routes ; with the Roads, Places, &c., found on Lieut. Temple's Map of the March of the 2nd Column of the Tal—Cho'tia'li Field Force.*

1. The Routes herein found are taken from 'Routes in Asia : Section II., Routes in Afghanistan,' by Major F. J. N. Mackenzie, Bengal Staff Corps, 1878.

2. Only such extracts from Major Mackenzie's book are taken as are necessary for the identification of the places found therein.

3. M. stands for Mackenzie, and T. for Temple, in the following pages ; and when these initials are found after a name, it means that the name in question is so spelt by Mackenzie or Temple, or that the name is found only in their works.

## MACKENZIE'S ROUTE, No. 6. BARKHAN to BORA, by the HAN Pass and the BALI DAKI.\*

Territory.	Authority.	MACKENZIE.					TEMPLE.	
		NAMES OF STAGES.	Distance.		Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Total.				
			Miles.	Fur.	Miles.	Fur.		
Khetran†	Gazetteer. Part I.	1. Kali Chupri (Khetran).	16	..	..	<p>The road goes over the Han Pass, which is difficult for a few yards, known as the Chor Trap. The hills rise on either side: on the S. is the Jandran, on the N. is the Dhaola. It then descends and follows the upper portion of the Kaha. Shortly before reaching a route goes to Chotali in a W. direction. The camping ground here is cramped. Water is not plentiful: some grass is obtainable.</p>	1. Tor Tsappar, or Ka'li Chuppri. ( <i>Debatable Lands, Lu'ai and Kle-tru'n</i> ).	<p>The Chor Trap = the Cho'r Turap on T.'s map, and the road is, as remarked by M., difficult there. The Ja'n-dhra'n (M. Jandran) Range does rise to the S., but the Dhaola (M. Dhaola) Range is some distance to the N., across Ba'rkho'm (M. Bar-khan); the hills immediately N. are the Chappar. The River Kaha = T.'s River Ka'han. M.'s camping ground must be near the Ba'la Dha'ki Pass on T.'s map. Vide Appendix A. 17th Stage. Chotali is used throughout by M. for T.'s Cho'tia'li.</p>

VOL. XLIX.	Khetran.†	Gazetteer. Part I.	Luni.†	U
2. Hanki Sar ( <i>Khetran</i> ).	16	32	..	The road is level, as a rule, but crosses a low hill, the Bali Du'ki, the ascent and descent of which are not difficult. Encamp at the mouth of the Hanki Pass. This place is near Chumalang, a range of hills in the Luni Pathan country.
3. Kucha .. ( <i>Khetran</i> ).	16	48	..	An easy march, following generally the bed of the Chumalang Stream. At the camping ground water is procured from a stream which runs into the Chotali Stream.
4. Sorkuram ( <i>Luni</i> ).	..	..	..	A watering place, which is in a large tank on a low hill.
5. Paundel Khan Kot.	..	..	..	A short march. An easy descent from Sorkuram Hill and down the Anabar River.
2. Hanokai Pass ( <i>Zarkha'n</i> ).				M's camping-ground is possibly the level space called Sha'kia'n in T's map at the top of the Hanokai Pass. This Bali Daki Hill is T's Jurnai Hills and Kahan Pass; the Hanki Pass is T's Hanokai Pass. Chumalang = T's Tsamulang, but it is not a range of hills but a valley district.
3. Kutsa Valley ( <i>Lu'ni</i> ).				The River Chumalang (M.) = River Tsamulang (T.), or more properly the River Kutsa (T.), M's camping-ground being at the junction of these rivers. The River Chotali (M.) referred to is probably the River Tsamulang (T.), which eventually reaches Chotiali (T.) under the name of the River Narasai (T.).
4. Trikh Kuram ( <i>Lu'ni</i> ).				Sorkuram (M.) and Trikh Kuram (T.) are identical names: both mean the Salt Springs.
5. Paund Kha'n Kot' ( <i>Luni</i> ).				The River Anabar (M.) = T's River Hanumbat.

## MACKENZIE'S ROUTE, No. 6—continued.

Territory.	Authority.	MACKENZIE.					TEMPLE.	
		NAMES OF STAGES.	Distance.		Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Total.				
		Miles.	Fur.	Miles.	Fur.			
Luni†		6. Bora .. ..	..	..	..	The road goes over a level plain the whole way. These marches are generally from 16 to 18 miles. Therefore the whole distance would be from 96 to 108 miles.	6. Bo'rai Valley (Sandar Khe'l, Ka'kar).	M.'s camping-ground is probably at some village in the Bo'rai Valley (T.) in the neighbourhood of Sharan on T.'s map. The distance, according to T.'s map, would be about 84 miles. The route is that followed by the Tal—Cho'tia'li Field Force.

\* M.'s title, according to T., should be Ba'rkle'o'm to Bo'rai Valley via the Han Pass and Bala Dha'ka.

† The Khe'tra'n Territory extended as far as Kucha (M.) = Kutsa Valley (T.), according to M., and the rest of the country belonged to the Lunis. According to T., however, the Khe'tra'n Territory goes only as far as Tor 'Isappar (T.), after which the country is Debatable Lands claimed by the Lu'nis as far as the Bo'rai Valley, while the Bo'rai Valley itself is owned by Sandar Khe'l Ka'kars.



Territory.	Authority.	NAMES OF STAGES.	MACKENZIE.				REMARKS.	NAMES OF STAGES.	REMARKS.
			Distance.		Total.	Rivers.			
			Stage.	Miles.					
			Fur.	Miles.	Fur.				
Afghanistan†	Part I.	1. Mita-koh ..	15 ..	15	..	..	There is an easy ascent in this march. The road passes Kala Chapr. On the left of the Pass is the Barboj Hill, on the right that of Baghao. Water is procured from a spring, and good fodder and grass are procurable. The camping ground is open.	1. Mitthi' Khu'in (Khe'tra'n).	M.'s Kala Chapr = T.'s Tor Tsappar (or Ka'li' Chuppr').
		2. Girsina ..	13 ..	28	..	..		2. Probably the Paste' Valley, or the Ba'ia Dha'ki Pass.	M.'s Barboj Hills = T.'s Barbu'z Hills. The Bagha'o Hills according to T. rise some way to the right, but the Gurmu'n Hills (T.) lead immediately to them. Girsina (M.) is not on T.'s map.
		3. Bahanwala Kach.	14 ..	42	..	..		3. Ba'han Kund	This place is not shown on T.'s map, but is probably in the valley between Cho'tia'li (T.) and Ba'han Kund (T.).
		4. Pantali ..	18 ..	60	..	..	This march is over an open plain. Good water, fodder, and wood.	4.	This is the route followed by the 1st and 3rd columns of the Tal—Cho'tia'li Field Force.
		5. Chotali ..	15 ..	75	..	..		5. Cho'tia'li ..	

\* M.'s title, according to T., should be Ba'rkhom to Cho'tia'li by Ba'han Kund. The road is the one marked on T.'s map as joining the route taken by the 2nd column of the Tal—Cho'tia'li Field Force at the Ba'ia Dha'ka encampment.

† As regards territories: according to T. the Independent Baloch (Khe'tra'n) Territory would extend as far as Mita-koh (M.) = Mizhi' Khui'n (T.); at Girsina (M.) it would be Debatable Land claimed by the Lu'nis; from near this to near Cho'tia'li (T.) it would be Zarkha'n Territory, and at Cho'tia'li (T.) Spin Tari'n Territory.

## MACKENZIE'S ROUTE, No. 8. BARKHAN to CHOTALI, by another Route.\*

MACKENZIE.										TEMPLE.	
Territory.	Authority.	NAMES OF STAGES.	Distance.				Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Total.	Miles.	Fur.					
Afghanistan—Zarkuans.†	Gazetteer. Part I.	1. Oriani or Sheruni.	..	..	..	..	..	Kolu Valley .. .. .	.. ..	This route cannot be identified, but see Route, No. 11. It seems that along M.'s Route, No. 8, the River Mitthi Khūm (T.) is followed to its source: then the Kolu Valley over the Barbūz Hills (T.) to Ziran (M.), a village probably just over them to the N., and then to Cho'tia'li (T.) by the Bhar Pass of Wells' and Showers' Route. The distance would be about 65 miles.	
		2. Sharani or Sheruni.	..	..	..	..	..	The road is level the whole way.			
		3. Ziran ..	..	..	..	..	..				
		4. Chotali ..	..	..	..	..	..				

\* M.'s title, according to T., should be Ba'rkho'm to Cho'tia'li.

† According to T. the Territory passed through would belong to the Zarkha'ns (M.'s Zarkuans), who are Patha'ns till near Cho'tia'li (T.), when it would become Spin Tari'n. The route would be all in Afghanistan.



## MACKENZIE'S ROUTE, No. 10. BARKHAN to LUNI PAENDEH-KOT,\* by SINGLI.

Territory.	Authority.	MACKENZIE.					TEMPLE.	
		NAME OF STAGES.	Distance.		Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Total.				
			Miles.	Per.	Miles.	Per.		
Luni—Kakray—Luni—Khetran.†	Gazetteer. Part I.	1. Barkhan ..	..	..	..	..	..	This route cannot be identified, but see Route No. 11. Supposing Shiran (M.) to be the Ziran of Routes Nos. 8 and 11, this route would seem to reach the River Pa'rai (T.), which = (T) the River Rud Kachi (M.), at Singli (M.), and then, following the level valley of the River Pa'rai shown in Wells' and Showers' Route, reaches Pa'nd Kha'n Ko't (T.) and the Lu'ni Valley (T.), via the River Narasai (T.), but this would entail 2 (not 1) marches from Singli. Luni Paendeh-Kot (M.) = Pa'nd Kha'n Ko't (T.). Luni Range (M.) = probably the De'rana or Turwa'l Hills (T.).
		2. Khan Mahamad Kot.	..	..	..	Cross Rankan-Kasham and go down Shiran Valley. Continue along the Shiran to the Luni Range, which crosses to this place. The water supply is from springs.		
		3. Singli ..	..	..	..	This march is level, lying up the Rud Kachi. Water is procured from springs draining the Luni Range. <del>Grass and wood abundant,</del> no supplies.		
		4. Luni Paendeh Kot.	..	..	..	.. .. ..	4. Pa'nd Kha'n Ko't.	

\* According to T. the title should be Ba'rkho'm to Pa'nd Kha'n Ko't.

† The Territories passed would be Khe'tra'n, then Zarkha'n, about Kha'n Mahammad Ko't (M.), and then Lu'ni for the rest of the way.

MACKENZIE'S ROUTE, No. 11. BARKHAN TO PAENDEH KHAN LUNI,\* by KOLU VALLEY.

MACKENZIE.							TEMPLE.		
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF STAGES.	REMARKS.
			Stages.		Total.	Rivers.			
			Miles.	Fur.					
		1. Kolu Valley	..	..	..	..	The road goes up the Han Pass, which is entered about 2½ miles W. by N. of Hasni Kot. Follow the bed of the water-course to its source, the Bibar Tak, descending which enter the Kolu Valley. To the E. is the high Jandran Range, W. Barboz. Cultivation in places; there is a watering-place on Bibar Tak, and water is procurable from pools in places. Camp between the villages of Riuni and Sherani. Level for some miles over the Kolu Valley, then N. over a low part of the Birboj Hills known as Bhar (where there is a watering-place, a fair-sized pool). Ziran is on a hill. Water from a tank.	..	This route cannot be identified by the stages mentioned, but by the description it would seem to follow the River Mitthi' Khun (T.) = the River Mita-Koh (M. Route, No. 7), at the head of which, as described, the Jandran (M.) = Ja'ndhra'n (T.) Range would be to the E. and the Barbu'z Hills (T.) = Barboj, Barboz, and Birbot (M.), to the W. Ziran (M.) would be somewhere in the neighbourhood of Brahamzai Khela't (T.). From thence the route would seem to go N. over the hills (? Turwal or De'rama (T.)) into the Luni Valley. Pandeh (or Paendeh) Khan Luni (M.) = Pa'ind K'ha'n Ko't (T.). River Anabar (M.) = River Hanumba't (T.).
	Gazetteer. Part I.	2. Ziran ..	..	..	..	..			

Zarkhans†

Gazetteer. Part I.

## MACKENZIE'S ROUTE, No. 11—continued.

Territory.	Authority.	MACKENZIE.						TEMPLE.	
		NAMES OF STAGES.	Distance.			Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Miles.	Total.				
			Miles.	Fur.	Miles.	Fur.			
Zarkhans.†	Gazetteer. Part I.	3. Wahwai ..	..	..	..	..	A very long stiff march over low hills draining to S.W.	4. Païnd K'la'n Ko't.	
		4. Pandeh Khan Luni.	..	..	..	..	A long march chiefly up the valley of the River Ana-bar, and in places along the bed of the stream, which is shing'y. Water abundant.		

\* The title, according to T., should be Ba'rkho'm to Païnd K'la'n Ko't.

† According to T. the territories passed would be Zarkha'n as far as Wahwai, and then Lu'ni for the rest of the march.

MACKENZIE'S ROUTE, No. 12. BAR NAMAI (KAKAR) to CHOTALI (TARINS \*), by the LUNI COUNTRY.

MACKENZIE.								TEMPLE.	
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.		Total.				
			Miles.	Fur.	Miles.	Fur.			
Kakar—Lundi†	Gazetteer. Part I.	1. Peendeh Khan Shahr Luni country.	16	..	16	..	A fair march, undulating, water from the Anabar, which (rising in Shinghar) drains via the Mar to Kachi.	1. Paid Kha'n Ko't.	The River Anabar (M.) = River Hanumba'r (T.), Shinghar (M.) = ? Sraghar (T.). If so the statement as to the rising of the River Anabar (M.) is wrong. The River Hanumba'r (T.) receives the waters of several rivers at the Hanumba'r Pass (T.), and can be traced along the Shor Valley (T.) past Chim-ja'n (T.) up the River Kachi (T.) as far as the Nangalu'na Pass (T.), near Mt. Ma'zhwo (T.). The second statement is also wrong. This river drains via the Ni'li Pass (T.) to the Kachi Desert (T.) to the W. by some miles of the Ma'r Pass (T.).

## MACKENZIE'S ROUTE, No. 12—continued.

MACKENZIE.							TEMPLE.			
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF PLACES.	REMARKS.	
			Stage.	Miles.	Fur.	Total.				Miles.
Kakar—Luni.†	Gazetteer. Part I.	2. Diler-Keshahr	..	..	..	..	..	..	2. Not shown.	Note.—If Bar Namai (M.) = Barminai (T.), it is a substantial village of the Sandar Kha'e/ Ka'kars in the Bo'rai Valley, amid plentiful cultivation, about 18 miles from Paind Kha'n Ko't (T.).
		3. Chotali	..	..	..	..	..	..	3. Cho'tia'li	

\* According to T. this title should be Barminai (Sandar Khe't, Ka'kar) to Cho'tia'li (Spin Tari'ns).

† According to T. the territories passed would be Sandar Khe't, Kakar, as far as the Hanumbe'r Pass (T.), and then Lu'ni as far as the Spin Tari'n country about Cho'tia'li.



MACKENZIE'S ROUTE, No. 18. BAR NAMAI (KAKAR\*) to DERA GHAZI KHAN, by TARKHORA and SAKHI-SARWAR.

Territory.	Authority.	MACKENZIE.						TEMPLE.	
		NAMES OF STAGES.	Distance.			REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Total.	Rivers.				
			Miles.	Fur.	Miles.	Fur.			
British. Kakar.	Gazetteer. Part I.	1. Alizai ..	..	..	..	..	..	..	This route cannot be identified. It is probably the route marked on T's map as that proceeding up the River La'ki (T.) and Sarghar Valley (T.) to the Bagha'o Valley (T.), passing to the N. of the Trik'a Kuram Pass (T.) and Tsamaulung Valley (T.) For Bar Namai, see Route No. 12.
		2. Sara ..	18	..	..	..	..	..	
		3. Tadzawi ..	20	..	..	..	..	..	
		4. Pawat ..	20	..	..	..	..	..	
		5. Tarkhora ..	..	..	..	..	..	..	
		6. Sakhi-Sarwar	17	..	..	..	..	..	
		7. Vidor ..	..	..	..	..	..	..	
		8. Dera Ghazi Khan.	..	..	..	..	..	..	
						See Route, No. 34 ..			

\* According to T. this title should have been Barminal (Sandar K'ac'l, Ka'kar), to De'ra Gha'zi Kha'n. See Route No. 12.

## MACKENZIE'S ROUTE, No. 26. CHOTALI to MENA (KAKAR\*), by the LUNI VALLEY.

Territory.	Authenticity.	MACKENZIE.					TEMPLE.	
		NAMES OF STAGES.	Distance.		Remarks.	Names of Stages.	Remarks.	
			Stages.	Total.				
			Miles.	Fur.	Miles.	Fur.		
		1. Paendeh Khan Kot Luni.	8	..	8	..	1. Paend Kha'n Ko't.	The distance, 8 miles from Cho'tia'li (T.) to Paend Kha'n Ko't (T.), is apparently wrong. But as Paend Kha'n was the late Sirdar or chief of the Lu'nis, it is possible that two or three places in the valley were so called. This Lu'ni Stream (M.) is probably the River Hanumba'r (T.) or the River Lo'ralai (T.).
		2. Tirag .. .. 3. Gwal .. ..	9 .. 9 ..	.. .. .. ..	17 .. 26 ..	.. .. .. ..	2. Not shown .. 3. Naigwa'l ..	This place cannot be identified. Gwal (M.) is from the description probably T.'s Naigwa'l, at the Bo'rai (T.) entrance to the Hanumba'r Pass (T.). If so, it is not in the Zho'b, but in the Bo'rai (T.) district. M.'s River Lu'ni here = T.'s River Loralai.
		4. Mena .. ..	..	..	..	..	4. Me'nd Pass ..	Mena (M.) is probably the Me'nd Pass (T.) to which the road, as described by M., would be level.

\* According to T. this title should be Cho'tia'li to Me'nd Pass.

† The territories passed according to T. would be Luni as far as the Hanumba'r Pass (T.), and then Kakar; the Sandar Khe'l section occupying the Bo'rai Valley.

MACKENZIE'S ROUTE, No. 28. DERA GHAZI KHAN to CHOTALI,\* by BARKHAN and the BAHANWALA KACH.

MACKENZIE.										TEMPLE.	
Territory.	Authority.	NAMES OF STAGES.	Distance.				Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.		Total.						
			Miles.	Fur.	Miles.	Fur.					
Khetran—Afghanistan.	Gazetteer. Part I.	8. Isani .. (Dakku Kot).	..	..	81	4	..	.. ..	8. I'sha'ni's. (Daku).	This Route is practically No. 7 reversed (q. v.).	
		9. Barkhan ..	8	4	100	..	..	.. ..	9. Ba'rkho'm.		
		10. Mita Koh ..	15	..	115	..	..	.. ..	10. Mit'hi'Khu'i'n.		
		11. Girsina ..	13	..	128	..	..	.. ..	11. Not shown.		
		12. Bahanwala Kach.	14	..	142	..	..	.. ..	12. Ba'han Kund.		
		13. Paniali ..	18	..	160	..	..	.. ..	13. Not shown.		
		14. Chotali ..	15	..	175	..	..	.. ..	14. Cho'tia'li.		

\* According to T. this title should be Dera Gha'zi Kha'n to Cho'tia'li by Ba'rkho'm and Ba'han Kund.

† For the territories passed en route, see Route No. 7.

**MACKENZIE'S ROUTE, No. 29. DERA GHAZI KHAN to the KAKAR COUNTRY, by PAWAL and ALIZAI.**

Territory.	Authority.	MACKENZIE.					TEMPLE.	
		NAMES OF STAGES.	Distance.		Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Total.				
			Miles.	Fur.	Miles.	Fur.		
Kakar—British.	Gazetteer. Part I.	1. Vidor ..	14	..	..	.. ..	1. Vaddor ..	The route cannot be identified. It is practically that shown in No. 13 (q. v.).
		2. Sakhi - Sarwar.	17	..	..	.. ..	2. Sakhi-Sarwar	
		* * * *						
		8. Barnamai in Bori country.	16	..	..	A village of 100 houses, fortified. Water from the Loralai, a stream draining via Lunis and Maris to Kachi.	8. Barnamai in the Bori Valley.	This description of Barnamai (T.) is more like the reality than that given in No. 12 (q. v.). River Loralai (M.) = River Lo'ralai (T.).

MACKENZIE'S ROUTE, No. 31. DERA GHAZI KHAN to CANDAHAR, by BARKHAN and MARGHAT.\*

Territory.	Authority.	MACKENZIE.					TEMPLE.	
		NAMES OF STAGES.	Distance.		Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Total.				
			Miles.	Fur.	Miles.	Fur.		
Afghanistan.†	Lumsden.	1. Make'ni ..	..	..	..	..	1. Not shown ..	This route is difficult to follow, but from the description, Lumsden must have gone to the N. of T.'s route by Me'khtar from Ba'rkho'm (T.), thence down the Bo'rai Valley (T.), up the Sho'r Kach (T.), via the River N. of the Rod River Gorge (T.), coming out at the N.E. corner of the Pishin Valley (T.). Lumsden's marches are very long, and the names given to the encampments very vague, as often as not district, and not strictly local names.
		2. Barkhan ..	..	..	..	..	2. Ba'rkho'm. (Khetran).	
		3. Bazhani ..	..	..	..	..	3. Not shown.	
		4. Mekhtar ..	..	..	..	..	4. Me'khtar.	
		5. Bori ..	..	..	..	..	5. Bo'rai Valley.	
		6. Sar-i-Bori ..	..	..	..	..	6. Shaka're'z or Waria'gai.	

MACKENZIE'S ROUTE, No. 31.—*continued.*

MACKENZIE.						TEMPLE.			
Territory.	Authority.	NAMES OF STAGES.	Distance.			REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Total.					
			Miles.	Fur.	Miles.	Fur.	Rivers.		
Afghanistan.†	Lumsden.	7. Dargao ..	..	..	..	..	..	7. Dargai in the Sho'r Valley.	
		8. Simantha ..	..	..	..	..	..	8. Amand Khe'l	The title Simantha not known in T.'s route, more than probably equals his Amand Khe'is.
		9. Marghat ..	..	..	..	..	..	9. Not known ..	Probably at some point to the N. of the Ro'd River gorge (T.), shown as the Mel-tarzar country in T.'s map.

10. Camp ..	..	..	..	Camp at a village (name forgotten), situated at the head of the same gen as Shahdad, only higher up.	10. Ha'ji' K'la'n or Lu'r K'la'n izai.	Seems to be one of these villages on T.'s map, by the description.
11. Shahdad ..	..	..	..	Nine hours. This is a Tari'n village, situated in a narrow valley. . . .	11. Sha'h Da'd ..	It is more than likely that T.'s Sha'hda'd in the Peshin (T.) is meant by this, but Lumsden's description of a narrow valley does not apply.
* * * *	..	..	..	..	..	..
21. Kandahar	..	..	..	..	21. Kandahar.	..

\* This title should state by Ba'rkho'm and Marghat, according to T.

† The territory passed, according to T., would be after Ba'rkho'm (T.), Ka'kar as far as Me'hlat (T.), then various sections of Ka'kars as far as Ha'ji' K'la'n (T.), and then Tor Tari'n.

MACKENZIE'S ROUTE, No. 32. DERA GHAZI KHAN to CANDAHAR, by the MOHAVI or BORI PASS.\*

MACKENZIE.										TEMPLE.	
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF STAGES.	REMARKS.		
			Stage.		Total.						
			Miles.	Fur.	Miles.	Fur.					
Afghanistan†	Leech.	6. Sandwali ..	..	..	130	..	..	6. Not shown ..	This is difficult to follow. Leech appears to have gone to the Mu'sa Khe'l (T.) country to the head of the Bo'rai Valley (T.), and then		
		7. Chinjan ..	15	..	145	..	..	8. Borai Valley			
		8. Bori ..	10	..	155	..	7. Chinjan.				

## MACKENZIE'S ROUTE, No. 32—continued.

		MACKENZIE.						TEMPLE.		
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Miles.	Pur.	Total.				Miles.
Afghanistan. <sup>†</sup>	Leitch.	9. Sazan ..	22	..	..	177	..	Small village. Stream.	9. Zagan Kachin Rod River Gorge.	by the Tal—Cho't'ali Field Force's Route, or nearly so, to Kandahar. Stages 7 and 8 should be reversed in order.
		10. Surkha'b Ford.	12	..	..	189	..	A small village. Stream.	10. Balozai Ka're'z.	
		11. Kure'zan ..	15	..	..	204	..	250 houses of Kakars ..	11. Ha'ji' K'ha'n.	This town Peshin of M., which occurs several times, is apparently a myth. It probably represents the cluster of Sayad and Tarin villages about A'li'zai (T.). M's Lora Valley is T.'s Peshin Valley.
		12. Peshin ..	15	..	..	219	..	A large town of Syads and Tarins, situated in the middle portion of the Lora Valley, 30 miles broad and 60 miles long, the upper portion of which is called Barshot, and the lower Shorawak.	12. A'li'zai ..	
		13. Khojak ..	21	..	..	240	..	.. ..	13. Kala Abdulla'h K'ha'n.	
		* * * *	..	..	..	308	..	.. ..	18. Candahar.	

\* This title, according to T., should be Dera Gha'zi' Kha'n to Candahar, via Mohavi and the Bo'rai Valley.  
<sup>†</sup> The territories after entering the Bo'rai Valley would be the same as those mentioned in the Account of the Tal—Cho'tia'i Field Force's march.



MACKENZIE'S, No. 33. DERA GHAZI KHAN to CANDAHAR, by PESH'N. This is one of MOHAN LALL'S ROUTES, and cannot be identified. It seems to have run South of the Route taken by the TAL—CHO'TIA'LI FIELD FORCE.

MACKENZIE'S ROUTE, No. 34. DERA GHAZI KHAN to CANDAHAR, *via* the SAKHI-SARWAR PASS.

Territory.	Authority.	MACKENZIE.					TEMPLE.	
		NAMES OF STAGES.	Distance.		REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Total.				
			Miles.	Fur.	Miles.	Fur.		
Afghanistan.	Gazetteer. Part II.	9. Kolu Chotali	..	..	..	..	9. Cho'tia'li ..	The river runs to not from Si'bi (T.) = Sebi (M).
		10. Thal ..	18	..	142	..	10. Tal.	
		11. Daki or Rah 12. Bagha'o .. 13. Smalan ..	30 24 30	.. .. ..	172 196 226	.. .. ..	11. Ra'ha. 12. Bagha'wa .. 13. Smalan.	Dhumad (M.) = Dumar (T.).

## MACKENZIE'S ROUTE, No. 34—continued.

Territory.	Authority.	MACKENZIE.					TEMPLE.	
		NAMES OF STAGES.	Distance.		REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Total.				
			Miles.	Miles.				
		14. Pai ..	30	256	200 houses of Dhumad Kakars	14. Pai.		
		15. Ingand ..	30	286	100 houses of Dhumad Kakars	15. Not shown.		
		16. Gulista'n Ka're'z.	32	318	300 houses of Sanatya Kakars.	16. Not shown ..		This term Sanatya not known to T.
		17. Peshi'n ..	20	338	A stream. A large town inhabited by Syads and Turus.	17. A'i'zai ..		For explanation, see Route, No. 32.
		* * * *						
		21. Kandahar	..	418	.. ..	21. Kandahar ..		

*M's Note.*—This road is extremely difficult, in many parts steep, winding, and dangerous. It is a bullock and an ass road. The people at Sakhi Sarwar say that the Pass was discovered by a man arriving in an incredible short space of time from Kandahar in search of some stolen camels, and that he was killed, that the secret might be kept. Shamandar-Khan Bamezat (Durani-T.), after being defeated at Dera Ghazi Khan by Shah Shujah-ul-Mulk, retired by this pass with 600 cavalry. The Emperor Babar seems also to have travelled it. Mahmud Khan, the father of the present Khan of Kelat, came by this Pass, and fought the Ustara'na' Kakars and Tarin Pathans at Thal (Leech). Mohan Lal, in a report dated 3rd March, 1836, to Lieut. Mackeson, gives the following information regarding this route. "It generally takes 7 marches by Sakhi Sarwar, viz., Jamkalo, Booisantra, Laba, and Dehi Now. I was informed that when Shah Zaman was at Kandahar, a pony laden with mangoes was sent him from Dera Ghazi Khan, and reached in six days, but no traders go by that route."

*T's Note.*—The marches are very long even for riding. This route, after leaving Smalan, seems to run to the S. of Mts. Mal'kilar (T.) and Spinskhar (T.), joining the Tal—Cho'ia'li Field Force's route at Mt. Ma'zawo (T.). Mohan Lal's story about a mangoe-laden pony reaching Kandahar from Dera Ghazi Khan in six days seems quite an impossibility.

MACKENZIE'S ROUTE, No. 35. DERA GHAZI KHAN to CANDAHAR, by the SAKHI-SARWAR PASS. Another ROUTE.

MACKENZIE.		TEMPLE.							
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Total.					
			Miles.	Fur.	Miles.	Fur.	Rivers.		
Khetran.	Sandeman, 1875.	7. Kot Mir Haji (Barkhan).	..	..	95	4	..	7. Not shown ..	The "native information" part of this route must be taken at a large discount. It is absurdly wrong in the distances from the Pishin Valley (T.) to Candahar and in the valley itself, and may be as much so in the remainder.
		8. Kolu .. .. (Northern part of Kolu Plain).	16	..	111	4	..	8. Ko'lu .. ..	This Kolu route is probably that observed in Route Nos. 8, 9, and 11 (q. v.).
		8. Bala Dhaka or Bala Dhaka	18	..	..	..	..	8. Ba'la Dha'ka	Zaran (M.) is probably the Ziran (M.), or Siiran (M.), of routes 8, 9, and 11 (q. v.).
		9. Chotali .. 9. Chotali .. 10. Thal ..	20 24 15	.. .. ..	.. 135 150	4 ..	..	9. Cho'tia'li .. 9. Cho'tia'li .. 10. Thal.	} These distances would seem to be about correct.

## MACKENZIE'S ROUTE, No. 35—continued.

Territory.		Authority.		MACKENZIE.				REMARKS.	NAMES OF STAGES.	TEMPLE.			
Territory.		Authority.		Distance.		Stages.							
Khetran, Zarkhan, Tartin, Kakar.		Sandeman and Information.		Miles.		Fur.		Miles.		Fur.		Rivers.	
11. Umarzai ..		12 ..		162		..		11. Not shown ..		From this point the route was ascertained from native information : the route seems to have run S. of the Tal—Cho'tia'li Field Forces route as far as Mt. Ma'zhwō (T.), and then to have joined it. As M. remarks, I'sab Kach (or I'sav or I'saf) is the name, not Yusuf, as the Q. M. G.'s Dept. still calls it.		Real distance from Lu'r Anga'ng (T.) is about 50 miles.	
12. Shinjazai ..		14 ..		176		..		12. Shinle'z.					
13. Shinjavi ..		12 ..		188		..		13. Sinza'wai.					
14. Pai ..		8 ..		196		..		14. Pai.					
15. Zughwanz ..		18 ..		214		..		15. Not shown.					
16. Zwangai ..		18 ..		232		..		16. Sipe'zlandai.					
17. I'sab Kach ..		15 ..		247		..		Name I'sab Kach, not Yusuf Kach.		17 I'saf Kach ..			
18. Nagand ..		12 ..		259		..		.. ..		18. Lu'r Anga'ng (Dof Valley).			
19. Gulistan Karez (Peshin).		15 ..		274		..		.. ..		19. Gulistan Ka're'z (Peshin).			
20. Kho'jak ..		12 ..		286		..		Kho'jak is the name of a tribe. . . The road runs through part of the Kho'-juk Pass.		20. Kho'jak ..		Real distance about 20 miles. Kho'jak is not the name of a tribe, but of a stream, the course of which is followed by the route known as the Kho'jak Pass to Europeans. The tribe inhabiting the district is the Achakzai (Durani).	



## MACKENZIE'S ROUTE, No. 37. DERA GHAZI KHAN to CANDAKAR, by SAKHI-SARWAR and the LUNI COUNTRY.

Territory.	Authority.	NAMES OF STAGES.	MACKENZIE.				TEMPLE.	
			Distance.		Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.
			Stage.	Total.				
			Miles.	Fur.	Miles.	Fur.		
Laghari.*	Gazetteer. Part I.	11. Shambozai	..	..	..	..	11. Shambozai .. (Bo'rai Valley).	All T.'s names are conjectural. See note below.
		12. Ahmadzai	..	..	..	..	12. Not shown.	
		13. Katgah ..	..	..	..	..	13. R. Kach (Bo'rai Valley).	
		14. Utman Khe'l	..	..	..	..	14. Near Ningand (Utman Khe'l).	
		15. Chenati ..	..	..	..	..	15. China li. (Shor Valley).	
		16. Nigandh ..	..	..	..	..	16. } Not recognised.	
		17. Dargai ..	..	..	..	..	17. }	
		18. Sohrai ..	..	..	..	..	18. }	
		19. Peshin ..	..	..	..	..	19. Pishin.	

M's. Note.—The distances of this route are not known, and the stages are only given in the hope that some corroboration of them may be hereafter found out.

T's Note.—This route follows No. 11 as far as Paind Kka'n Ko't (T.) = Paendah Khan Shahr (M.), after which Sha mbozai (M.) is to be recognised as Shambozai, Bo'rai Valley (T.). And if the other stages given by M. are in the correct order, then they are apparently as T. has conjectured them to be as far as China'li (T.). But the whole route has a doubtful look about it.

\* This term is apparently wrong, and should be Ka'kar.



## MACKENZIE'S ROUTE, No. 38—continued.

MACKENZIE.										TEMPLE.	
Territory.	Authority.	NAMES OF STAGES.	Distance.				Rivers.	REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Total.	Miles.	Fur.					
			Miles.	Fur.	Miles.	Fur.					
		19. Zaghwanza	25	..	254	..	..	..	19. Not shown ..	This route probably runs S. of the Tal—Cho'tia'li Field	
		20. Zwangai or Spinzandai.	17	..	271	..	..	..	20. Shpe'zandai.	Force's route, and is most likely the same as that in Route No. 35.	
		21. Yusuf Kach (Kandahar Territory).	15	..	286	..	..	..	21. I'saf Kach.		
		22. Pain Kala (near Khojak Pass).	18	..	304	..	..	..	23. Sayad Paind.		



MACKENZIE'S ROUTE, No. 41. DERA GHAZI KHAN to MAMAND, by BARKHAN and CHOTALI.\*

MACKENZIE.										TEMPLE.
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.		Total.					
			Miles.	Fur.	Miles.	Fur.				
Not known.	Gazetteer. Part I.	9. Chotali ..	..	..	..	..	Hasani ..	..	9. Cho'tia'li.	Probably Hasni' Ko't (T.) in Ba'rkho'm (T.).  River Anabar (M.) = River Hanambar (T.). So Mamand (M.) must be in the Luni Valley.
		10. Jalar Kot ..	..	..	..	..	Fort of Paza ..	..	Not recognized.	
		2. Bareli Sir ..	..	..	..	..	..	..		
		3. Nili Wad ..	..	..	..	..	..	..		
		4. Mamand ..	..	..	..	..	..	The whole way down the valley of the Anabar.		

This route cannot in any way be recognised.  
\* According to T. this part of the title should be Ba'rkho'm and Cho'tia'li.

MACKENZIE'S ROUTE, No. 42. DERA GHAZI KHAN to MENA (KAKAR) (= MEND PASS [T.]), by BARKHAN and CHOTALI.  
This Route is the same as No. 26 (q. v.).

## MACKENZIE'S ROUTE, No. 43. DERA GHÁZI KHAN to MEKHTAR and PAENDEH SHAHR,\* by CHOYI-RAKHI and RANKAN KOT.

Territory.	Authority.	NAMES OF STAGES.	MACKENZIE.			REMARKS.	NAMES OF STAGES.	REMARKS.
			Stages.	Distance.	Rivers.			
			Miles.	Per.	Total.	Miles.	Per.	
Khetran—Luni.	Gazetteer. Part I.	8. Rankan Kot.	8	..	89	..	..	8. Not shown.
		9. Girda Kach Sandwel.	..	..	..	..	..	9. Not shown ..
		10. Chumalang Sir.	..	..	..	..	..	10. Not shown ..
		11. Lakhi Sut	..	..	..	..	..	11. Banks of River Laki.
		12. Paendeh Shahr.	..	..	..	..	..	12. Paend K'ha'n Ko't.

\* This title should be, according to T., Dera Gházi Khan to Mekhtar and Paend K'ha'n Kót.

MACKENZIE'S ROUTE, No. 44. DERA GHAZI KHAN TO PAENDEH KHAN (KOT),\* by SAKHI-SARWAR and RAKNI.

MACKENZIE.										TEMPLE.
Territory.	Authority.	NAMES OF STAGES.	Distance.				REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Miles.	Fur.	Total.				
			Miles.	Fur.	Miles.	Fur.	Rivers.			
Luni—Khetran.	Gazetteer. Part I.	6. Mian Khan Kot.	..	..	..	..	..	Level the whole way up the valley of the Churi. . .	6. Not shown ..	This is probably T.'s Bagha'o Valley.
		7. Karwada ..	..	..	..	..	..	Cross the Bagha'o Range, running in a S.W. direction. . .	7. Not shown ..	This route seems to run N. of the Tal—Cho'tia'li Field Force Route, and <i>viâ</i> the Bagha'o valleys and hills of T.
		8. Silman Mara Tranga.	..	..	..	..	..	... Water from a spring, which drains to the Chumalang Stream.	8. Not shown ..	This must be at the head of T.'s Tsumalang Valley = M.'s Chumalang.
		9. Laki Lahar	..	..	..	..	..	.. .. .	9. Banks of River La'ki'.	
		10. Paindeh Khan Kot	..	..	..	..	..	Level march the greater part of the way.	10. Paindeh Kha'n Kot.	This description would answer for a march from the River La'ki' (T.) to Paindeh Kha'n Kot (T.).

\* The title, according to T., should have been Dera Gha'zi Kha'n to Paindeh Kha'n Kot.

MACKENZIE'S ROUTE, No. 146. CANDAHAR to DERA GHAZI KHAN, by BORI (= T.'s BO'RAI VALLEY), MEKHTAR, and BARKHAN (= T.'s BA'RKHO'M). This ROUTE is No. 31 reversed (q. v.).

MACKENZIE'S ROUTE, No. 218. ROJAN to CANDAHAR, by TAL CHOTALI.\*

Territory.	Authority.	MACKENZIE.						TEMPLE.	
		NAMES OF STAGES.	Distance.			REMARKS.	NAMES OF STAGES.		REMARKS.
			Stage.	Miles.	Total.				
			Fur.	Miles.	Fur.	Rivers.			
Afghanistan.	Gazetteer. Part I.	1. Bibak Ka Dera.	..	..	..	..	3 days' journey .. ..	.. ..	This route cannot in any way be recognised.
		2. Sanne ..	..	..	..	..	1 "		
		3. Pilan ..	..	..	..	..	1 "		
		4. Kolu ..	..	..	..	..	1 "		
		5. Tal Chotali	..	..	..	..	1 "		
		6. Kandahar ..	..	..	..	..	11 "		

M.'s Note.—This route is given for what it may be worth. (Mohan Lal.)  
 \* This should be, according to T., by Tal and Chot'ia'li.

MACKENZIE'S ROUTE, No. 219. ROJAN to CANDAHAR, by KAKAB COUNTRY, SHAL (= QUETTA [T.]), and PESHIN (PISHIN [T.]).

Territory.	Authority.	MACKENZIE.						TEMPLE.	
		NAMES OF STAGES.	Distance.			REMARKS.	NAMES OF STAGES.	REMARKS.	
			Stage.	Total.	Rivers.				
			Miles.	Miles.	Fur.				
Afghanistan.	Gazetteer. Part I.	1. Bibak Ka-Dera.	..	..	..	3 days' journey .. ..	.. ..	This route cannot in any way be recognised.	
		2. Khan ..	..	..	..	2 "			
		3. Sang Munai	..	..	..	2 "			
		4. Kakar ..	..	..	..	4 "			
		5. Shal	..	..	..	4 "			
		6. Peshin ..	..	..	..	3 "			
		7. Kandahar ..	..	..	..	9 "			

Mr's Note.—I give this route for what it may be worth (*Mohan-Lall*).

IV.—*The Modifications of the External Aspects of Organic Nature produced by Man's Interference.* By Professor GEORGE ROLLESTON, F.R.S., Oxford.

[A Lecture delivered at the Evening Meeting, May 12th, 1879.]

THE modifications of the external aspects of organic nature produced by man's interference form so large a part of the results of all human activities whatever, that the very first thing to be said in a single evening's lecture on the subject should consist in a specification of the particular spots in that vast area which the speaker proposes to touch upon. I propose, then, with your permission, firstly, to glance at certain of the alterations, positive and negative, in the landscape of our own country, which we ourselves and our fathers before us have intentionally or unintentionally produced; secondly, to notice a few of the many alterations produced by disforestation in our own and other countries; and thirdly, to show what our knowledge as to the localities to which the parent stocks of the majority of our domestic animals and of our cultivated plants may be assigned, implies, as to the modifications of other regions of the world's surface which man has produced by his processes of importation and acclimatization. A few speculations as to the future may perhaps be found room for after these details as to the past and present.

I do not propose to enter into the large question of the extent to which man may, with any propriety, be spoken of, as he has been, as a "geological agency," a "telluric" or a "cosmic" agent; and I will at this very outset of my lecture profess that I think man's power of modifying the climate of the earth upon which he lives must be considered,\* when all the facts of the

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\* Upon this large question, one only of many large questions which the various details of this subject suggest, and by which, even when most in the concrete, they excite general interest, it is well to hear Mr. Robert Rawlinson as he spoke in a lecture on Meteorology, delivered November 1868, before the Royal Engineers at Chatham (p. 7):—

"It is certainly true that man modifies climate over tracts that have been cultivated; but it is asserted, further, that in various parts of the world, through cutting down forests, and in consequence of other operations, the works of man, climate has been so far modified as to have had its character absolutely changed. 'The Thames is not now frozen over as in times past,' one place has more rain than formerly, another place less, and so on. If by assertions such as these it is intended to be implied that any works of human hands have actually altered the current course of nature, I must meet such allegation with a positive denial. The most stupendous of human works can affect only the comparatively small and narrow space of the earth's surface upon which they may have been executed. Evaporation has only an indirect and incidental reference to the land—its real

case are taken into account, to be confined within much narrower bounds than some writers are willing to admit. It is possible to overstate the extent to which man can go in the direction of exhausting the soil by wasteful or neglectful agriculture, and to fall over-easily, not to say over-willingly, into despair as to the restoration to fertility and political consideration of countries so mismanaged. And if it is possible to overstate man's influence upon the dry land and its inhabitants, it is necessary to be very cautious as to asserting for him any power of altering, except infinitesimally, the vast area of marine life. Now, as the surface of the sea is to that of the land as four to one, and as I feel somewhat desirous of showing that the extent of the subject I have chosen is not quite so disproportionately large in relation to your time and my abilities as the mere words in which it is announced might seem to indicate, I should like to dwell a little upon this delimitation of it before entering upon the subject itself.

For one of those striking suggestions *qui font penser si elles ne font pas croire*, has been made to the effect that man's interference has been potent, even over the sea, to an extent which men of science have not usually claimed, and poets have denied to be possible. Mr. G. P. Marsh, the author of a well-known work on 'The Origin and History of the English Language,' 1862, as well as of the highly interesting work on physical geography which appeared in 1864, under the title of 'Man and Nature, or Physical Geography as modified by Human Action,' and as a second edition, ten years later, under the title of 'The Earth as modified by Human Action: a new edition of Man and Nature,' suggests in this latter work that the phosphorescence of the Mediterranean, unknown to, or at any rate scarcely noticed by, the ancient writers, may have been greatly increased since their days through human action in the way of extirpating the whale.

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dependence being on the great ocean and the greater sun. And so, while man may exert an influence upon climate over the little area of his operations, his works can avail nothing to affect the grand features of nature even over that small area, or to disturb the majestic scale on which she accomplishes her purposes. Cosmical meteorology is unaffected, and must continue to be unaffected by human agency. The powers of man can never seriously modify the heat of the sun, cloud, rain, or climate, as these have reference to the world at large; all statements, therefore, which would assign cosmical atmospheric effect to the cutting down of forests, to land drainage, land cultivation and such like agencies, must be treated with practical disregard."

For other discussions on the same subject, see Reclus, 'The Ocean,' sect. ii. pp. 93-95, *ibique citata*: Unger, as regards Egypt, 'Sitzungsbericht Akad. Wiss. Wien,' xxxviii. pp. 89-93, 1859; De Candolle, 'Hist. des Sciences,' 1873, p. 412; Link, 'Urwelt und Alterthum,' ii. pp. 128-160, 1822.

"Is it not possible," writes Mr. Marsh,\* "that in modern times the animalcula which produce it (the phosphorescence of the Mediterranean, the most beautiful and striking of maritime wonders), may have immensely multiplied, from the destruction of their natural enemies by man, and hence that the gleam shot forth by their decomposition or by their living processes, is both more frequent and more brilliant than in the days of classical antiquity." In a more utilitarian spirit Middendorff, in his 'Sibirische Reise,' † points out that a continuance of the wasteful destruction of the whalebone whale in the northern seas will render it impossible to utilise for man's profit the innumerable small crustacea and mollusca of the Polar seas which that whale converts into train oil! The profligate inconsiderate slaughter again by the Kolushes of the sea-cow, *Rytina Stelleri*, a sirenian "whale" of the region of Behring's Straits, which lived upon sea-weed, has reduced these savages to the necessity of using this self-same sea-weed for manuring their potatoes, which useful vegetable, however, gives them a much less savoury and sustaining food than was manufactured, so to say, for their forefathers in the organism of the sea-cow they extirpated. It is perhaps a little ungracious to point out that the most elegant of these three correlations and interdependences is not so definitely demonstrable as the other two. In the first place, it may be objected as regards Mr. Marsh's suggestion, that the Mediterranean whales, ‡ not comprehending in their number the right whale, *Balaena mysticetus*, are not whales which would either themselves prey so largely or exclusively upon the small invertebrata alluded to by Middendorff, to say nothing of those very much smaller, upon which the phenomenon of phosphorescence so much more largely depends; or be themselves so unrelentingly pursued by man for the sake of their oil. And secondly, without dwelling upon any such quantitative relations as the size of the microscopic "animalcula" just alluded to may suggest, it is clear that the square area of the Mediterranean makes up a space for the extirpation from which even of so large an animal as a "whale," a very consider-

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\* *Loc. cit.*, 1st ed. p. 114; 2nd ed. p. 104.

† Band. iv. 2 t. p. 848, 1867.

‡ The principal larger cetacea of the Mediterranean are piscivorous dolphins, such as *Delphinus tursio*, *Delphinus globiceps*, *Delphinus orca*; it is at least open to doubt whether such whales as the *Balenoptera* and the sperm whale can be considered as anything more than occasional visitants of Mediterranean waters. See Wagner, "Die Geographische Verbreitung der Säugethiere," 'Abhandl. d. 2te Classe d. Ak. d. Wiss. München,' iv. Bd., Abth. i.; and Sundevall, 'Die Thierarten des Aristoteles,' 1863, p. 88; 'Aristoteles' Thierkunde,' Aubert und Wimmer, Bd. i. pp. 73-74, 1868.



able fleet would have been required. We know the numbers and the tonnage of the ships which, till the discovery of petroleum \* in large and available quantities, formed the whaling fleets of quite recent times, 1849-1850, the American whalers in the Sea of Okhotsk alone numbering 250† three-masted vessels, with a minimum tonnage of 500 tons; but of any such whale-slaying machine having ever existed in the Mediterranean we have, within my knowledge, no record whatever. Now the capacity of the ancient writers for "not marking withal" matters of interest to the modern naturalist, can scarcely be over-rated; but it did not affect matters relating to war and the chase so much as such trifles as Stonehenge and the peaceful though colossal aqueduct near Nîmes.‡ And as a matter of fact, we find in those writers abundance of references made to the means employed for the capture of the tunny, a form of the chase which is in no way more exciting, more useful for illustration and metaphor, nor even more lucrative, than would that of the whale have been if it had been carried on to any appreciable extent in the large sea on the shores of which so much of the history of the world has been written and acted. The Greek word *κηρεία* means a fishery, not of Cetacea, but of tunnies.

A story relating to the natural history of these true "fishes" will show, in the way of a parallelism, the facility with which mistaken views may obtain currency, *si modo imaginationem feriant aut intellectum vulgarium notionum nodis astringant*, quantitative measurements, statistics, relative proportions of masses to other things, and even literature itself, notwithstanding. In the Oxford University Museum we have a large skeleton of a tunny (*Scomber thynnus*), brought from Madeira, before my time, by my friend, Dr. Acland. A foreign naturalist, whose name, under the circumstances, I think well to withhold, but whose reputation is commensurate with his very extensive performance, going over the Museum with me one day, remarked, after paying a not undeserved compliment to the skeleton; "That fish never came from the Mediterranean." I answered that, as a matter of fact, it had belonged to an ocean-going individual; but I also asked how it was possible to differentiate a Madeiran from a Mediterranean specimen. My friend answered, "The Mediterranean is too closely fished by man to allow of any tunny attaining such dimensions." I was silent, though very vivid recollections of long, however pleasant, days

\* See Marsh, 'The Earth as modified by Man's Action,' 1874, p. 103.

† See Middendorff, *l. c.*, p. 849.

‡ Marsh, *l. c.*, pp. 426-427.

of coasting on those shores, without meeting any considerable number of vessels, or passing, as on the south coast of Asia Minor, any considerable towns except in ruins, might have conspired with my recollections of St. Paul being driven up and down for fourteen nights in Adria, to make me question this explanation. Some time after, I found that Cetti records tunnies of no less than from 1000 to 1800 lb. as being caught now-a-days in the Sardinian fisheries! \*

The results of investigation into the extent to which man's interference may have told injuriously upon the propagation of fish smaller in size, if not smaller in importance, such as the herring, may possibly show us that here too we have exaggerated our own powers for mischief. Not only is the sea a large field, but cyclical oscillations in the "Frequenz" of its inhabitants are at least as possible, irrespectively of our interference, as are the similar variations observable in air-breathing animals; and many an animal, as, for example, the horse in South America, has become extinct even in recent, not to speak of earlier geological times, owing to quite other than human agencies. Man has no monopoly of destructive agencies, neither, if he had, would that, as it seems to me, prove that, "though † living in physical nature he is not of her, that he is of more exalted parentage, and belongs to a higher order of existences." He is not, in strictness of language, a "cosmic," a "telluric," a "geological," nor a "supernatural agency." He may ultimately obtain, as prophesied by Mr. Wallace,‡ such a mastery of the dry land as to supersede on that portion of the world's surface the agency of natural selection; but he cannot even there effect cosmical changes in the climate, and as regards the sea, it is possible enough, as Mr. Moseley has suggested on the two concluding pages of his 'Notes by a Naturalist on the *Challenger*,' that when the present races of animals, plants, and men shall have perished, the deep-sea animals, at least, if not those of higher levels, "will very possibly remain unchanged from their present condition."§

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\* See Lenz, 'Zoologie der alten Griechen und Römer,' 1856, p. 485.

† Marsh, *l. c.*, p. 34.

‡ 'Natural Selection,' p. 326.

§ Having been compelled to express dissent from Mr. Marsh's suggestion as to the phosphorescence of the Mediterranean having been a less striking phenomenon in ancient than it is in modern times, I cannot forbear to pay my poor meed of thanks to this writer for the pleasure and instruction which his works have afforded me. The 'Kulturpflanzen und Haustiere,' of Herr Victor Hehn resembles Mr. Marsh's work in dealing with the subject of man's action on organic nature in a way which attracts the attention and stimulates the thought at once of the politician, of the literary man, and of the man of science. I expressed my opinion upon the merits of the first edition of this work in the

Beginning at home, let us consider first of all what are the most prominent changes which man has effected in the land-

'Academy' of August 15, 1872. A third edition of it appeared in 1877, considerably enlarged and improved. And it may be observed that for dealing at all adequately with this subject, and indeed for avoiding very gross blundering in so dealing with it, a man must have some knowledge not only of purely scientific subjects, of the facts of history on the large scale, and of the results at least of philological inquiry, but also of the power which commercial legislation and commercial enterprise have for altering the distribution of the various vegetable and animal articles of trade; otherwise he may fall, as some have fallen, into the error of supposing commercial results to have been produced by changes in the laws, not of man, but of climate. I make this remark for, among other purposes, the purpose of introducing another remark to the effect that it is much to be regretted a fresh edition of Dureau de la Malle's '*Économie Politique des Romains*' should not be brought out in these days: it is a work of permanent value, though it bears the date of 1840. As works of a more exclusively scientific character, but still intelligible easily to persons possessed of a mastery of the rudiments of botany and zoology, and of cardinal importance in researches such as these, I will specify:—

De Candolle, '*Géographie Botanique raisonnée*,' 1855.

Unger's "*Botanische Streifzüge*," in the '*Sitzungsberichte*' of the Vienna Academy from 1857 to 1859 inclusively.

Isidore Geoffroy St. Hilaire, '*Histoire Naturelle Générale des Règnes Organiques*,' tom. iii., 1862.

K. E. Baer, '*Reden und Studien aus dem Gebiete der Naturwissenschaften*,' four octavo volumes which appeared in the years 1864, 1873, and 1876, and contain much of geographical as well as of other interest. This illustrious scientist was for some years from 1839 onwards concerned, together with v. Helmersen, in bringing out at the cost of the St. Petersburg Academy, a periodical, '*Beiträge zur Kenntniss des Russischen Reiches*.' In one of the volumes (xviii. 1856, pp. 111–115) of this periodical, a short paper by v. Baer appears, the purport of which is shown by its title, "*Die Uralte Waldlosigkeit der Süd-russischen Steppe*," "*The Aboriginal want of Wood on the South Russian Steppe*." This paper was written in supplementation of a paper which had appeared in the fourth volume of the same periodical, 1841, pp. 163–198, with the same object of deprecating a useless and essentially nugatory attempt to make these steppes timber-bearing. From it I will give an extract, partly because it is so characteristic of the manner of the great biologist, and partly or mainly because it shows how pure natural history can be brought to bear upon political questions and may save a Government from engaging at great expense in chimerical undertakings. V. Baer says, *l.c.*:—"At that time (1841) I had forborne to bring up a piece of evidence (in favour of the South Steppe never having been wooded) which is much older than Herodotus; and the present communication has only just the purpose of putting out this evidence, for doing which I have had no earlier opportunity. This piece of evidence is furnished by the squirrels. They are found throughout the Russian empire, so far as trees are found to grow, even in the Caucasus, but with the exception of the Crimea and Kamtchatka, although both these peninsulas have the food which the squirrel wants, and the south coast of the Crimea has it in great abundance. Now from these facts the following conclusion can clearly be drawn, namely, that when these animals reached the southern borders of the forests in South Russia, and the eastern borders of the forests in Siberia, the wide expanse of the open South Russian steppes and also the bare levels northward in Kamtchatka were already in existence. When was it, it may be asked, that the squirrels came to these borders of the forests? I don't know, but that they did come to them before any historical period nobody will be inclined seriously to dispute."

Oscar Peschel, in his '*Neue Probleme der vergleichende Erdkunde*,' 1876, p. 1881, adds in explanation of this curious and convincing argument, "A climb-

scape, so far as the landscape is made up of organic elements, of our own country. I have not undertaken, and shall not

ing animal dependent for food upon seeds of the trees could not of course travel across the sunny plains of grass; and consequently the South Russian districts in question must have been treeless ever since there were squirrels on the south boundary of the Russian forests; and there can scarcely be any doubt that they were there thousands of years before the time of Herodotus." Oscar Peschel gives no specific reference to v. Baer's works; and v. Baer himself, or his printer, curiously, a wrong one in his 'Autobiography,' p. 644. 'Nor have I found any reference to it in Professor Stieda's 'Karl Ernst von Baer, eine biographische Skizze,' 1878. I have therefore another justification for the giving of these details, and am glad if I have thus saved others trouble which I had to take for myself, not unhelped, however, herein, by the staff of the Bodleian library.

If Oscar Peschel has made one trifling omission, he has *per contra* made some of the most important additions to geographical and anthropological knowledge, separately and combined, which have been made since the time of Ritter. I need scarcely specify his

'Völkerkunde,' 1874.

'Abhandlungen zur Erd- und Völkerkunde,' 2 vols., 1877-1878.

'Physische Erdkunde,' of which three fascicles have appeared in the present year.

The general principles to be found expounded in the works above specified, have found a practical application in the particular question, Are the countries along the shores, and especially the eastern shores, of the Mediterranean to be looked upon as having been exhausted by man's interference with them in the way of agriculture, and so robbed of any chance of political rejuvenescence? And with this question is connected that which asks whether any perceptible change of climate has been effected in the same regions by the same agency. The literature of this controversy, which has been carried on obviously enough by partisans filled at least on one side with political bias, is, if we give only the most important memoirs, not very extensive, and may perhaps usefully find a place here.

C. Fraas, in his 'Klima und Pflanzenwelt,' 1847, takes the pessimistic view, which

J. P. Fallmerayer, in a review published in the same year apparently, and republished in his 'Gesammelte Werke,' 1861, ii. 462, endorses with a bitter readiness.

C. Fraas, in the 'Geschichte der Landbau und Fürstwissenschaft,' München, 1865, had the opportunity of again expounding his views, p. 350 *et passim*, in his account of Liebig's views. Those views are to be found in

Liebig, 'Natural Laws of Husbandry,' Eng. Trans., 1863, and in his 'Chemische Briefe,' the ninth edition of which bears date 1878.

Oscar Fraas, possibly or presumably a relative of C. Fraas, from certain passages in his 'Aus dem Orient,' 1867-1878, would appear to be of similar views to those of his namesake; he speaks (vol. i. p. 213) in defiance of Arago's views, as expounded in 'Œuvres,' vol. viii., 'Notices Scientifiques,' vol. v. ed. 1859, p. 222, of a "verändertes Klima der Nilländer," and says (p. 215), what will be read with some surprise by Indian officials, "Heutzutage erlahmt die Energie selbst eines kräftigen Europäers unter der Sonne von Egypten . . . man erschläft, wird träge und faul, man fängt an zu bummeln!" An excellent answer to all this is given by

Theobald Fischer, 'Beiträge zur Physischen Geographie des Mittelmeerländer, besonders Siliens,' 1877, p. 154, *usque ad finem libri*, p. 167.

Fr. Unger, in his 'Wissenschaftliche Ergebnisse einer Reise in Griechenland,' 1862, has dealt similarly with this question at the conclusion of his small but excellent memoir, pp. 187-211.

The views of Victor Hehn, and those of the recently deceased botanist and author of an authoritative work, 'Die Vegetation auf die Erde,' 1872 (translated

attempt to speak of such changes as those which the embankment of our rivers has effected, referring those of my hearers who may feel an interest in this particular change, to Sir Christopher Wren's disquisition upon the subject, which may be found with very much else very well worth reading in the 'Parentalia,' p. 285. But I have to say that changes of proportionately equal magnitude have been effected in our landscape by the interposition of man in the way of introducing into it trees which, though now naturalised, are demonstrably not indigenous to our soil. The most striking of these changes are those which have been effected by the introduction of the common elm, *Ulmus campestris*; next, if indeed not equal in magnitude, those effected by the introduction of certain coniferæ; and then, at a long distance behind as regards numerical importance, those effected by the introduction of the horse-chestnut and the sycamore. I do not of course forget that such trees as the walnut, and a host of other trees which are now entering into the picturesque, if not into the economical aspect of Great Britain, are as foreign to our soil as their names remind us they are; but I am not delivering a treatise upon our forest trees, and I shall confine myself within the limits which the three or four trees or orders of trees specified in the preceding sentence mark out for me. Let me begin with the simpler cases, those of the horse-chestnut and the sycamore first. I should indeed be ungrateful, living as I do within such easy sight of the beautiful, if not unrivalled, horse-chestnuts of New College Gardens, if I did not express my sense of gratitude to the men who introduced that tree into England. There is, of course, as little question as to its non-indigenouness as there can be as to its beauty. Botanists, however, differ as widely

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into French in 1877 by Tchihatcheff), viz. Grisebach, may be given in the words of the latter, when reviewing the former in the 'Göttingen gelehrte Anzeiger,' 1872, xlv. p. 1767. With these views we agree. They run thus:—"Mit Recht verwirft er die Meinung dass die klassischen Länder erschöpft seien und einer Erneuerung ihrer ehemaligen Blüthe keine natürliche Grundlagen mehr böten. Er trifft das Wesen der Sache, indem er sagt, dass ihr Klima, im Grossen aufgefasst, nicht vom Boden und seiner Vegetation, sondern von 'weitgreifenden, meteorologischen Vorgängen' abhängt, die durch ihre geographische Lage bestimmt, 'von Afrika und dem atlantischen Meere bis zum Aralen und Sibirien reichen.' Ebenso muss man sein eingehendes Verständniss dieser Frage anerkennen, wenn er im Bereich der Agrikultur-Chemie sich gegen die Ansicht ausspricht, dass der Boden Südeuropas durch seine alte Kultur an mineralischen Nahrungsstoffen erschöpft sei. Wie die lombardische Ebene durch die Alpenflüsse mit frischen Silicaten und Kalksalzen gespeist wird, so liefern die so manigfaltig gegliederten Gebirgsketten, welche die Länder am Mittelmeere erfüllen, aus dem Innern ihrer Felsmassen unerschöpfliche und durch das fliessende Wasser stetig ausgebreitete Vorräthe, um die Erdkrumen der Thälen und Tiefebene immer wieder auf Neue zu befruchten."

as possible as to what its native land may have been. I have not been able to satisfy myself that Hehn, *i.e.*, pp. 348 and 457, is right in saying that we owe the introduction of this tree into Europe to the Turks. All but certainly this was not the case if D. Hawkins, as cited by Fiedler in 'Reise durch alle Theile des Königreiches Griechenlands,' 1840, vol. i. p. 649, is right in saying that this tree grows wild on Pindus and Pelion. There are not wanting species on either side of the Greek Archipelago which no naturalist would divide or bifurcate, nor, I imagine, has the Greek Archipelago existed in its disconnecting discontinuity as long as the species *Æsculus hippocastanum*.

The sycamore is another undoubtedly non-indigenous tree, but it is thoroughly naturalised and abundant in certain parts of England; and notably in the Lake District it forms a very characteristic feature of the landscape, when it is massed round the equally distinctive old farm-houses. In the Lake District its leaves have assumed a somewhat darker colour than they ordinarily bear in the southern and midland counties; and its bark often exhibits what some naturalists would call a mimetic analogy to that of its fellow-countryman the Oriental plane. The sycamore has yet other claims upon our attention, as the readiness with which its seeds take root might have long ago destroyed, even to the eyes of the least observant, that *idolon theatri molestissimum et ineptissimum* which taught that if a plant could be proved to be non-indigenous in a country it was useless to expect it to flourish there.\*

I will now turn to the Coniferæ. In another place,† I drew attention to the well-known and universally accepted fact, that till comparatively recent times the Scotch fir (*Pinus sylvestris*), the yew (*Taxus baccata*), and the juniper (*Juniperus communis*), had been the only representatives in these islands of the natural order Coniferæ. I did not dwell then, and I will not dwell now, upon the greatness of the difference which has, in the last three hundred years, been effected in the general aspect of our country by our successive importations of the spruce, the larch, and the silver fir from other European countries, and the multi-

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\* For an example of the operation of this notion, so opposed to the most obvious facts, see 'Viti (Fiji), by Berthold Seemann,' p. 426, where, apropos of the statement "the cotton plant is not indigenous in Fiji," we have the following note:—

"Most of the newspapers took this fact to be a serious drawback to the successful cultivation of cotton, quite forgetting that cotton is not indigenous to the United States and many other countries in which it flourishes. I made exactly the same statement (cotton is not indigenous in Fiji), but added that notwithstanding, it had become almost wild in some parts, so well is the country adapted for its growth.—B.S."

† 'British Barrows,' p. 724.

tudinous trees belonging to the same order from North America, from North India, from California and Mexico, from Japan, from China, and from Chili, the names of which "plants of the fir tribe suitable for the climate of the United Kingdom, cultivated by . . . nurserymen and seed merchants," fill up some sixty-six pages in a sale catalogue now before me. Any traveller, by rail or otherwise, can appreciate the greatness of the alteration which has been effected by man on nature, if he will but bear in mind the three trees just specified, and recollect as he sees the silver fir spreading out with its airy interspaces in the sky-line, and the larches and spruces clothing the hill-side in acres upon acres, that these trees were as little known to the untraveller Englishman of the times of the Tudors as were the "Weymouth" pine, the Deodara, the Wellingtonia, or the Araucariæ. The statesman, indeed, can read something of the political and commercial history of this kingdom in the trees which speak of the various countries, farther distant apart from each other than are "China and Peru," with which England has successively come into *rappor*t; and the changes which he has suggested to him are scarcely, if at all, less complicated than those which the naturalist can show to have been similarly set up in the world of lower life represented by birds and insects. Since I wrote as above (*l. c.*) I became acquainted with an article on "Coniferous Trees" in the October number of the 'Edinburgh Review' for 1864, to which I would beg to refer my hearers for a detailed and very interesting account of the successive successful acclimatisations of members of this natural order; and upon the ground thus sufficiently occupied I will not encroach. It is not uninteresting, and not entirely irrelevant either, to observe that Great Britain and Ireland were both richer in Coniferæ in recent geological periods than they have been since those times down to those of the Stuarts. In the sunken forest at Cromer, in Norfolk, in a deposit\* of a period immediately preceding the glacial, we find the spruce fir represented, together with nearly all the rest of the scanty list of really indigenous post-glacial English trees. In the Cromer forest we find the spruce represented, together with the Scotch fir, the yew, the oak, the elder, the birch, and the blackthorn. The ash has somehow failed to join itself on to this company; but we see it forming one of it, though the spruce in its turn is absent as well as all other trees, in many small copses or thickets in out-of-the-way

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\* See 'Rudiments of Geology,' by Samuel Sharp, F.S.A., F.G.S. 2d ed. 1876, p. 169.

parts of this country. Such, for example, are many mountain-lime-stone headlands in parts of the Principality, where the Welshman—in spite of the traditional hatred for trees which his race, like some other ancient races, as, for example, the Spanish, is said to entertain—has allowed the ancient flora to remain, and left it unmixed with foreign importations. The intervention of the glacial period will easily account for the wiping out of the spruce from the list of post-glacially indigenous British trees; but it is not so easy to explain how it has been that the silver fir (*Abies pectinata*), which is found in the Scottish peat, was absent from at least historic Britain till the year 1603; and that the *Pinus mughus*, the *Tæda* of the Romans, should be found in the peat-bogs of Ireland, and should subsequently have become as thoroughly extinct there as the Irish elk, *Cervus megaceros*. On the other hand, it is not difficult to understand how it has been that the Scotch fir, with characteristic pertinacity and hardiness, followed up the retreating glacial forces more closely than even the “Norway” spruce; for at this day it propagates itself, either by self-sown or by squirrel-sown seeds, much more surely and widely than does this equally or more than equally hardy tree.

I must not leave the subject of the Scotch fir without rectifying an error relating to it which various writers,\* from the time of Cæsar’s Greek translator down to those of Evelyn and of myself inclusively, have fallen into when writing about it. Julius Cæsar, in an often-quoted and as often mistranslated passage,† says of Britain, “*Materia cujusque generis, ut in Gallia, est præter fagum atque abietem*,” and these words are ordinarily taken to mean, “There is wood of all kinds to be found in Britain, as in Gaul, *except* the beech and the fir.” Poor old Planudes of course blundered, as a Constantinople monk of the fourteenth century was sure to blunder, “reaping,” as Mr. Philip

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\* Planudes fl. 1327 A.D. See p. 46 of Appendix to Cambridge edition of Cæsar’s Works, 1706.

Evelyn, ‘Silva, a Discourse of Forest Trees delivered in the Royal Society, Oct. 19, 1662,’ Ed. Hunter, 1776, p. 139.

Hasted, ‘Phil. Trans.,’ vol. lxi., for year 1771, pt. 2, 1772, p. 166.

De Candolle, ‘Géogr. Botanique,’ pp. 154, 689. 1855.

Johns, ‘Forest Trees of Great Britain,’ p. 42.

Rolleston in ‘British Barrows,’ p. 722–724. To do myself justice, I did not err so widely as my companions in this matter. I was as ignorant of Latin as they; but I accused Julius of only one blunder, while they accused him of two. If I had really believed that “Cæsar doth not wrong but with good cause” it would have been better for me. As it was I made a poorish “explanation” for Julius as regarded the *abies*, but confessed that I felt some doubt as to the accuracy of his statement as to the beech.

† De Bello Gallico, v. 12.



Smith has remarked apropos of his edition of the Anthology, "the reward which often crowns the labours of bad editors who undertake great works;" and the words of Julius appear, *l. c.*, in the following Greek dress: *πᾶν εἶδος δὲ δένδρου παρ' αὐτοῖς, ὡς ἐν τῇ Γαλατίᾳ πλὴν φηγοῦ τε καὶ πεύκης, φύεται.* Evelyn, speaking of the fir (*p. 139, l. c.*), uses the following words: "which with this so common tree (the beech) the great Cæsar denies to be found in Britain; . . . but certainly from a grand mistake, or rather, for that he had not travelled much up into the country." Hasted (*l. c.*), in 1771, translates the words thus: "This island has every kind of tree the same as Gaul *except* the fir and the beech. Some scholars hold still that this is the right way of translating the words. But my friend Mr. J. P. Muirhead, the author of the Life of James Watt, pointed out to me that *præter*, in the language of Julius, does by no means always mean *except*, but means sometimes simply *besides*. For example, when \* Ariovistus stipulates that Cæsar and he should meet and confer on horseback, each bringing ten assessors with him, Cæsar's words run thus: "Ariovistus, ut ex equis colloquerentur, et *præter* se, denos ut ad colloquium adducerent, postulavit." And we may learn from this single passage that it is as well to be quite sure of an author's meaning before we impute "a grand mistake" to him, especially if he happen to be really a grand man. I may add that Cicero, in a single passage in the same connection as one which I shall have to refer to shortly for another purpose,† uses the word *præter* in both the senses, *except* and *besides*. His words, telling us how Verres bestowed himself, *somni, vini, stupri, plenus*, run thus: "Vir accumberet nemo *præter* (*except*) ipsum et prætextatum filium; tametsi recte dixerim *sine exceptione* virum quum isti essent neminem fuisse . . . Mulieres autem nuptæ nobiles *præter* (*besides*) unam minorem Isidori filiam, &c. &c. Erat Pippa quædam uxor . . . Erat et Nice foemina." My own natural history studies had familiarised me with the line of Plautus, Stich., 3, 460:—

"Mustela murem ut abstulit *præter* pedes"—

and should have shown me that the *local* meaning of *præter* is also its *general* meaning, and that it retains the idea of "by the side of," even when by the aid of a negative, expressed or implied, it comes to be more conveniently translated by the word "except."

It would be perhaps showing as much over-anxiety to vindi-

\* De Bello Gallico, i. 43.

† X. in Verrem, Act. ii. lib. v. 31, 81.

cate Cæsar's accuracy, as has been shown of over-readiness to impute inaccuracy to him, if I were to point out, after Parlatore,\* that Cæsar might have been familiar with the Scotch fir itself, *Pinus sylvestris*, even in Italy, to say nothing of the other European countries traversed by his victorious eagles. An historian who was or was not a professed botanist, might without any sensible man blaming him, speak now-a-days of all the common pines, "Scotch," "umbrella," "cluster," &c., as "pines"; my present belief is that Julius would similarly have spoken of them all as *abietes*, and would probably have included the "firs" proper under the same name as these "pines." But I wish hereby to retract the suggestion *l.c.* as to his having meant the silver fir, *Abies pectinata*, by the word *abies*, in the much vexed passage in question; though that suggestion was made in the best possible spirit, and is scientifically unanswerable as against those unhappy persons who feel malevolently towards Cæsar, which I never did, and are at the same time, as I was when I made that suggestion, unable to translate him correctly.†

I have yet a couple of points to mention regarding the use which man has made of the Coniferæ, and the alteration which he has in comparatively recent times effected, firstly by, and secondly upon, the distribution of this order of trees.

The same number and the same article on Coniferous Trees in the 'Edinburgh Review,' October, 1864, gives the interesting history of the recovery by Brémontier and his followers, from the condition of blown sand, of the vast area (100,000 acres) in the Landes of Gascony, which should in justice to him bear his name. His agency was the "cluster" pine, elsewhere called the "pouch" pine, the *Pinus pinaster* of the botanists.‡ The

\* 'Études sur la Géographie Botanique de l'Italie,' p. 37, 1878.

† Mr. J. A. Froude cannot be accused of any want of loyalty to the subject of his 'Biography'; still we may say to him

Nec te tua plurima, Pentheu,

Labentem pietas, nec Apollinis infula texit—

For in that work, 'Cæsar, a Sketch,' 1879, I read, at p. 271, of Britain when invaded B.C. 54, that "the vegetation resembled that of France, save that he saw no beech and no spruce pine." Cæsar must have seen the beech, but not even Cæsar could have looked either far enough forwards or far enough backwards to have seen the spruce-fir growing in Britain.

‡ The pine employed by Brémontier is the *Pinus maritima* of botanists; it is, however, as nearly allied to the *Pinus halepensis* as the two cedars *Deodara* and *atlantica* are to each other. And I used a picture enlarged from a drawing of Unger's ('Wissenschaftliche Ergebnisse,' p. 88) of a "*Pinus halepensis*," growing in Eubœa, to show the general habit of the tree which had proved so useful in the French Landes. It may be well, for my own credit at least, that I here explain that I had with me, and suspended in the lecture-room, a number of pictures in illustration of my subject. These I will herewith enumerate, stating the points

resinous and other products of this plantation form now an important article of commerce; their sale and the planting of

they were intended to make intelligible to the eyes, thereby sparing the ears, of those who honoured me by coming to my lecture. I had with me—

Firstly, the picture just referred to, which was intended primarily to illustrate, as were some of the other pictures, the mischievous action of the goat, underwood being almost entirely absent; two goats being drawn browsing upon such shrubs as were left, and keeping them down to a line corresponding with what Ruskin calls in this country, where the old legal rule, *bidentibus exceptis*, still happily holds good in practical pasturage, the "cattle line." The great mass of the picture was occupied by the tall pines in question, and the bare, barren, and sunburnt native rocks, which irrigation and the prohibition of goats might cover with figs and olives.

Secondly, two pictures from Lepsius's Egyptian 'Denkmäler,' Abtheil iii. 46, iv. 3, and iv. 126, represented goats and men allied in the unholy task of destroying the palm-trees of an enemy's country. In one of these pictures the goats had assumed the same arboreal habits which they are drawn as exhibiting in Hooker and Ball's 'Marocco,' p. 97, in the argan tree. This picture was also shown enlarged by permission of Sir Joseph Hooker. One of the pictures from the Egyptian monuments was of the time of the 12th dynasty, and therefore, Professor Rawlinson informs me, as early, according to Wilkinson, as from B.C. 2020 to B.C. 1860, or even, according to Brugsch, as from B.C. 2378 to B.C. 2200. It is of course important to know that the palm was so early as this a familiar object to Egyptian eyes, when, as I further learn from Professor Rawlinson, "the earliest date-palms represented on Assyrian monuments belong" to no earlier a date than B.C. 833 to B.C. 858; and that even in Babylonia, where they now flourish far more than in the region corresponding to Assyria proper, the palm-trees have not monumental evidence for an earlier date than B.C. 1500. A cylinder from Babylonia, of uncertain but not earlier date than this, is figured in Professor Rawlinson's 'Ancient Monarchies,' vol. iii. p. 23, 2nd edition. These dates furnish something of an argument in favour of Unger's suggestion that the palm may have had its original home in Upper Egypt; and may make it seem more probable that the Assyrians learnt from the Egyptians, than the Egyptians from them, the art of cultivating this tree. Kämpfer ('*Amenitates Exoticae*,' p. 714), declares himself to be, as indeed the inhabitants of Egypt themselves were, of opinion that Arabia was the native home of the palm, and he dismisses the claims of a more westerly origin in the four plain words, *nam Africam non moramur*. We shall, however, go hereafter in detail into the claims of the "Dark Continent."

Thirdly, a picture of the gathering in of the date harvest in Persia, taken from Kämpfer's book just referred to, which was used to illustrate in connection with certain reports of the formation in Algeria of date plantations in regions previously barren (see Reclus, 'Earth,' i. p. 98, Eng. trans., 1871; Laurent, 'Mémoires sur le Sahara,' p. 85, 1859, *cit.* Marsh, *l. c.* p. 482) the power of man for producing happiness and enjoyment in localities previously but sandy, thirsty deserts.

Fourthly, a picture enlarged from one given in Martius' '*Historia Naturalis Palmarum*,' iii. 1823-1850; vol. iii. pl. 120, of the ruins of the ancient Agrigentum, with their modern surroundings. It is thus described by Martius himself, p. 249, note:—"Chamaerops humilis, alia depressa, alia elata octodecimpedalia, in agro Agrigentino, antiquissimis ruinis celebri, depicta a Cl. Frid. Gaertner, architecta. Muros conspicis magnifici templi quod Jovi Olympio olim consecratum, nunc inopis palmæ, opuntiae, et agaves domicilium factum est. Junonis Lucinae, Concordiae et Herculis templa diruta remotiores tenent colles." It would be difficult, except possibly by the introduction of the orange and olive into the picture, to give a more instructive view of a Mediterranean landscape as altered by man's interference. The ruins of what Pindar called the fairest city raised by earthly men, of what Virgil called "*maxima longè mœnia*," speak to man's power for destruction; the agave and the prickly pear tell of his discovery and utilisation of America; the fan-palm with its spreading, far-reaching roots and suckers stands

more of the previously barren, shifting, sandy waste, received a great impulse, as did many alien interests, by the interruption to American imports caused by their great Civil War,\* and they occupy a large space in some of our various public exhibitions of economic products. Some little uncertainty appears to hang about the question as to the person to whom the chief credit of this work, which has been compared, and not unjustly, with that of the recovery of Holland from the empire of the sea, is really due. The 'Edinburgh' reviewer assigns it, apparently with good grounds for so doing, to M. Brémontier, and to a period beginning with the year 1789. Professor Koch,† whilst mentioning (*l. c.* p. 293) Brémontier, couples with his name that of M. Desbiry, but adds that the greatest credit of all is due to M. Ivry, of Bordeaux, whom he visited himself in 1864, on his own plantations at Pian, and found to be still a vigorous man though eighty-six years of age. Professor Koch pays a meed of praise to the late Emperor Louis Napoleon for his exertions in the same direction and locality; and it is, I think, to another name connected with the Second Empire that the credit is, rightly or wrongly,‡ assigned, of having enabled the wastes of Gascony to produce and to boast of the heterogeneous multitude of useful products displayed in our industrial exhibitions as being now manufactured out of the pine imported thither from Corsica.

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as it did in the far-off times when the prisca inhabitants of Sicania fed upon its roots, as Cicero (*X. in Verrem, Act. ii. lib. v. 38, 39*) suggested they did before Ceres gave them in that very island the gift of Cerealia, and as it did in the much later days when Verres, by malversation and maladministration, reduced Roman sailors on the shores of what was called the granary of Rome, and was but a few days' sail from Rome, once again to pacify hunger by feeding on that characteristic Mediterranean plant. The importance which plants imported from the New World have assumed in the Old, forms a subject by itself; of the two just specified, besides their other applications, we learn from Admiral Smyth's still unsuperseded '*Memoirs of Sicily and its Islands*,' 1834, p. 17, that they "form impenetrable palisades for fortifications, and in the plains they present very serious obstructions to the operations of cavalry."

\* Lavergne's '*Economie Rurale de la France*,' ed. iv., p. 296.

† Professor Koch, of Berlin, who seems to consider the planting of the vine to be the climax of attainment in the way of utilising a previously desolate region, writes thus of it, after visiting the spot: "Weniger möchte es bekannt sein, dass unsere beliebten rothen Bordeaux-Weine ebenfalls in diesem Departement der Haiden wachsen, und dass der Boden vor nicht sehr langer Zeit hier erst für die Weinfelder urbar gemacht wurde. Die guten Weine wurden früher auf dem gegenüberliegenden Ufer der Gironde gewonnen," p. 294.

See also Clavé, '*Études-sur l'Economie Forestière*,' 1862, cited by

Marsh, *l. c.*, pp. 595-606.

Reclus, '*Earth*,' Eng. trans., i. 82.

Edmond About, '*Le Progrès*,' chap. vii.

Lavergne, '*Economie Rurale de la France*,' 1877, p. 297 *seqq.*

‡ Wrongly very likely—in England we are content to ascribe the invention of the safety lamp to George Stephenson.

It is in this same many-sided connection interesting to note, if we in these recent centuries have re-introduced several conifers which were indigenous, like the spruce, in the immediately Pre-glacial, or like the silver fir, in the still later period of the deposition of the peat, but perished either before or during the Prehistoric human period,\* and if we are still actively employed in adding to the number of species of this natural order in our landscape by importation from every quarter of the globe, from China to Chili, in proportions represented by a descriptive catalogue of more than 400 "plants of the fir tribe suitable for the climate of the United Kingdom," we have, I think it may be shown, also considerably diminished the numbers of one of the few of our native representatives of this order. This is the yew (*Taxus baccata*). It is a tree which, though valuable to the turner, nevertheless grows too slowly to pay well in these days when the spirit which makes haste to be rich, makes a "vegetable manufactory" of the hill-sides of our Lake District (to use Wordsworth's prose), by covering them with the rapidly growing larch—to say nothing of the severe competition, even as a wood for the turner, to which the beautiful woods of New Zealand and other southern colonies now subject it. Formerly matters stood somewhat differently, when it could be said:—

"England were but a fling  
But for the eugh and the gray goose wing."

But when the invention of gunpowder, and the application of it to the science and art of projectiles, "put me a caliver into Wart's hands," the principal *raison d'être* of the yew-tree was destroyed. A man who drew a good bow, even if he drew it at a venture, had needs have "the limbs, the thews, the stature, bulk, and big assemblage" of the men who won the battles of Agincourt, of "Cressy red and fell Poitiers;" and if he were to put his arrows into the clout, he had needs have a steady and well co-ordinated eye, as well as well co-ordinated and strong arms, to be effective. Such men were sent on many a campaign from England; and for the commencement of such campaigns, before the hardships of war had impaired the soldier's condition, no more efficient man-slaying machines could, when fair stock was taken of the relative deadliness of the available weapons, have been conceived of, till the rifled musket was discovered. But even English archers were liable to the influence of short rations, hard work, and weather; and as campaigns were not always settled in a few weeks, the firelock, a weapon

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\* See De Candolle, 'Géogr. Botan.' 807.

which Feeble and Wart, even if they were not their "craft's masters," could, under the supervision of that admirably qualified musketry instructor "Master Corporate" Bardolph, learn in a few weeks to use with as much effect as the most stalwart of tournament champions, displaced the bow and arrow, though not entirely till after the wars of the Roses. This displacement seems to have entailed the disappearance from many and many a locality of lines and avenues of yew-trees, of which here and there we still have a few representatives left us, and which, in such places as the combes in chalk districts, form in the way of contrast, and indeed also intrinsically, such a pleasant and interesting feature of the landscape.\*

Of the vastness of the change which the introduction of the common elm (*Ulmus campestris*) into Britain has produced in the landscape, any one who will count and compute the numbers of the trees visible in any one of our midland counties at one view will readily convince himself. It has, I think, been said already by some one, and may now be said again, that previously to the development of our railroad system all the experiences and sensations of the great majority of our rural fellow-countrymen were gained within an area limited by a horizon bounded by an uninteresting row of these hedgerow trees. Of the evidence for the belief that this tree was really imported by the Romans, and not known here previously by the Britons, however familiar it be to us Saxons, I have spoken elsewhere.† To the grounds for that belief, there stated, let me here add the authority, firstly, of the Cromer forest, in which no elm (not even the wych elm, of which I do not here speak) was found; and secondly, of Mr. Bentham,‡ who says of it: "In Britain it is the most frequent elm in central, southern, and eastern England, but in the north and the west only where planted. It is, indeed, doubtful, whether it be really indigenous anywhere in Britain."

Man's increasing command over the inorganic world has, in yet another way and in another time, and that our own, very powerfully modified the botanical world around him; and as

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\* Having above quoted Mr. Hasted to his disadvantage, I wish to make some compensation to his memory by here quoting a sentence of his with which I entirely agree, but which I had not read when I wrote as I have done in the text, relatively to the yew. It is the concluding sentence of the already quoted paper in the 'Philosophical Transactions' of 1771, and runs thus: "Whoever has been much acquainted with the woods and tracts of ground lying on our chalky hills will surely never contend that the yew is not the indigenous growth of this country."

† 'British Barrows,' pp. 721-722.

‡ 'Handbook of the British Flora,' p. 746.

this particular instance of the efficiency for good and evil is a matter of some practical consequence, and one which is still a subject of discussion and comes into the sphere of legislative interference, I will mention some of the facts concerning it. I refer to the effects which the by-products of certain manufacturing factories exercise upon the vegetation of the districts in which they are situated. One of the most interesting papers I have ever had the good fortune to listen to was one read by my friend Mr. Robert Garner, F.L.S., at the British Association Meeting held at Newcastle in the year 1863, and printed in the Report for that year at p. 114, as also in his 'North Staffordshire Tracts,' p. 10, reprinted from the 'Staffordshire Advertiser' of 1871. His words run thus: \* "With respect to chemical impurities of the air, different plants have different susceptibilities for such influence, and the greater or less impurity of the atmosphere may indeed be shown from the effects on plants. Thus the rhododendron will flourish in an air fatal to the common laurel; wheat will luxuriate where a holly or oak will die. Some plants which appear naturally to luxuriate in the coal strata—as the oak, holly, or some ferns—die when the mines begin to be worked. Fortunately, annuals suffer least; for instance, corn and wheat do well where nothing else can, and perhaps the exhalations in question may even tend to ripen them. An increasing deterioration of the atmosphere in towns and mining districts may be estimated by means of plants as follows:—1. In the smallest degree of impurity, trees are destitute of the leafy lichens, and *Ericæ*, the Scotch fir, and the larch die. 2. Next, the common laurel, the Deodara cedar, the Irish arbutus, the laurustinus, and the yew die. 3. The araucaria, the thuia, the common cedar, the mezereon, and the Portugal laurel die. 4. The common holly, the rhododendron, the oak, and the elm die. 5. Annuals still live, and the almond, poplars, and many roses thrive, fruit-trees are barren, peas unproductive. 6. *Hieracia*, *Reseda lutea*, the elder, some saxifrages and sedums, with many syngenesious and cruciferous weeds, still luxuriate."

The mountain and moorland plants are most, just as the nettle, the elder, the shepherd's purse, the sow-thistle, are least susceptible of antihygienic influences; the former as well as the latter set of organisms showing the influence of habituation, both alike being unable to "leave their place of birth; they cannot live in other earth," or rather air. The presence of the

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\* British Association Report, l. c.

former would be an infallible sign on the hygienometer; the presence of the latter encourages us not to despair.\*

\* That man has sometimes the power of undoing the mischief he has done, even by the somewhat perilous, and often mischievous, action of legislation, a *précis* of the evidence taken and given before Royal Commissions on noxious vapours, and embodied in a Blue Book of last year's (1878) date, will abundantly show. This *précis* I take from a letter signed "Edward Sullivan," in the 'Times,' December 2, 1878. In this letter Mr. Sullivan says, in summing up for the defence of the alkali manufacturers:—

"As regards the injury done to the picturesque value of land by alkali manufacturers, I am afraid there is no doubt they must plead guilty. In some cases, especially in that of Sir Richard Brooke, the damage is most distressing; but there is a concurrence of evidence from Widnes, Weston, Runcorn, St. Helens, Flint, and Hebburn, that during the last four years, since the passing of the Alkali Act of 1874, the damage has very much diminished, and that in districts where the number of works has not increased the present damage is inappreciable.

"At page 10 of the Report, Major Cross states he lives a mile and a half from the centre of Widnes. Since the passing of the Act of 1847, he had a fair crop of fruit, and roses and flowers grew luxuriantly.

"Page 11 (Runcorn). Mr. Wigg stated he had planted 1800 trees round his house, about a mile and a half from the nearest works, 'which were all growing very well indeed.'

"Page 11 (St. Helen's). Mr. Gamble produced two photographs of a plantation 1000 yards from the works, one taken in 1862 for the use of the Lords' Committee; the other, taken in 1876 at the same spot, showing a manifest improvement in growth and condition of trees.

"Page 11 (Flint). Mr. Muspratt stated that subsequently to the Act of 1874 vegetation was not affected at a greater distance than 200 yards. He instanced gardens containing elms and other trees flourishing within 500 yards, and old oaks growing luxuriantly within a mile of his works.

"As regards the depreciation in agricultural value caused by alkali works, a great deal is to be said.

"Pages 8 and 9 of the Report. Major Cross, 'for seven years a member of the Widnes Local Board, and five years its chairman,' states the average selling value of land in and about the present site of Widnes in 1854 not to have exceeded 50*l.* per acre. The greater part of the site of the town and works of Widnes was bought in 1860 at from 30*l.* to 40*l.* per acre. Since that time favourable sites within half a mile of Widnes have been sold at the rate of 1600*l.*, 2400*l.*, and 4800*l.* per acre.

"Land at Ditton, a mile and a half from Widnes, which in 1858 was not worth 60*l.* per acre, was sold for 300*l.*, and of late particular lots in Ditton and Cronton, the one being two miles and a half, the other three and a half, from Widnes, were sold at 600*l.* per acre. These purchases were made for building cottages, villas, &c. As regards letting land for agricultural purposes, Major Cross adduced several extracts from the poor-rate books, showing that the estimated rental of land situated near the works had steadily and often largely increased. For instance, at Cuertley, on which the principal Widnes works are built, and which contains 1573 acres, mainly the property of Sir Richard Brooke, the estimated value of agricultural land per acre was, in 1861, 1*l.* 12*s.* 7*d.*; 1871, 1*l.* 16*s.* 3*d.*; 1857, 2*l.* 3*s.* At Ditton the value of land for agricultural purposes had risen during the same period from 1*l.* 13*s.* per acre to 3*l.* 5*s.* 7*d.* (page 9).

"Major Cross meets the allegation of the deteriorated value of farm produce, by stating that in the near neighbourhood of Widnes milk sells at from 3*d.* to 4*d.* a quart; hay at from 6*l.* to 8*l.* per ton. He states he has known hay and straw grown within a mile of Widnes fetch the highest price in the Liverpool market, and that in 1875 the Manchester and Liverpool Agricultural Society gave to the



M. de Lavergne, in his work on the 'Économie rurale de la France depuis 1789,' does not mention the name of any indi-

tenants of a farm of 80 acres within two miles of Widnes the prize for the best cultivated land.

"Page 10. 'Mr. Wigg, while admitting the damage done in past times to Sir R. Brooke's estate, asserted that the value of his property, through the proximity of the alkali works, had enormously increased.' That estate consists of 1200 acres on the Lancashire side and 5600 on the Cheshire side; and Mr. Wigg stated his reason for believing that the selling value of the Lancashire estate was at this moment greater than that of the two estates together in 1860.

"Mr. H. Beswick and Mr. H. Linaker, both agents to important estates near the works at Runcorn, Weston, and Widnes, and long and intimately connected with the district, bore witness to the same effect as Major Cross. Both, while admitting occasional visitations from gas, and consequent injury, declare that they have never had any difficulty in finding suitable tenants at invariably increased rates. 'I can more readily,' says Mr. Beswick, 'let land at better rents within 5 or 6 miles of Runcorn than I can on other portions of Lord Cholmondeley's estates 20 miles away. . . . Within the last few years I have refused 4*l.* a statute acre for land for agricultural purposes close to Widnes works.' 'The rentals on the property in the neighbourhood of the works under my care have gradually increased during my time, but they have increased more rapidly during the last few years. The rental of two farms at Rock Savage, near to the Weston works, has increased from 1013*l.* in 1863 to 1503*l.* in 1876 and 1877. I regret that I cannot say the same for estates under my care at the distance of 20 miles." (Page 11.)

"I think, therefore, I may fairly assert that when the Report on Noxious Vapours, 1878, comes to be fairly examined and discussed, as most certainly it will be where so extensive an industry is at stake, it will prove that, great as may be the nuisance complained of by the landowners of Lancashire, they have in the great majority of cases received a very substantial set-off in the increasing value of their land, both for rental and for sale.

"The alkali industry is a necessity in a manufacturing country. If it is an evil, it is a necessary one. Sulphuric acid, the base of all alkali products, may be called the heart of all manufacturing industries. The consumption of it is the surest gauge of their condition. There is scarcely a manufactured article in daily use that is not more or less dependent on it. To enhance the cost of its production by hasty or ill-judged legislation, would enhance the cost of half the industrial products of the country. It is not the greed of manufacturers that has increased the number of alkali works, but it is the increased trade of the country that has demanded an increased supply of an indispensable element of production.

"If new works had not sprung up at Widnes or St. Helen's, they would certainly have sprung up elsewhere. It is to be regretted that so many works have congregated at Widnes and St. Helen's. The consumption of coal alone, a million tons at the former and a million and a half at the latter annually, would of itself cause great nuisance to the neighbouring districts; but who, pray, is to blame for this evil? Not, certainly, the manufacturers who bought and leased the land offered them by the landowners, but the landowners who offered it.

"Complaints of injury done to trees, to the picturesque value of ornamental property, do not come with very good grace from the very proprietors who have sold and leased contiguous land at very high prices, for the expressed and avowed object of erecting and extending the works they now wish to destroy.

"Sir Richard Brooke, whose name most frequently occurs in the report, and who is undoubtedly the greatest sufferer in the picturesque value of his estate, has within the last few years leased land immediately opposite his house, at a very high rental, for the erection of alkali works and the deposit of alkali waste; and, I understand, has hundreds of acres more to be let for the same purpose: nor

vidual as having been specially concerned in the great and successful undertaking of redeeming the Bordeaux Landes. But his remarks upon it \* have so much of value in them, and touch upon so many of the multitudinous sides—historical, political and economical—which this enterprise, and other State-supported enterprises, present to us when we study them in their entirety, that I think I may be allowed to quote them as they stand. After touching on the dangers which pines more than other woods are exposed to from the sparks which the railway train so readily and so fatally scatters in such dry and parched districts; but omitting the not inconsiderable, even if not complete, safeguard which the planting of lines of the *Robinia pseudacacia* on either side of the railroad would furnish; which he might very well have added, as this tree does such good service in this way in other parts of France: he dwells on the cost and the necessity of wells, and the State help in the way of subventions for this purpose; he alludes with some not unjustifiable bitterness, detectible again at pp. 453–461, to the “lost opportunities” for good in the way of developing the resources of the Landes which the warlike folly of expenditure in Algeria has entailed; and finally, his allusions to the unhappy relations into which the Moors were successively brought with the Spaniards, with the French, and lastly with the Turks, are not without a singular interest and instructiveness. But M. Lavergne shall speak for himself and in his own language:—

“Un peu avant la révolution de 1789, au moment où tout s'éveillait à la fois, de grandes compagnies de défrichement se fondèrent, mais sans succès, pour avoir voulu aller trop vite; d'autres épais du même genre ont échoué plus récemment par la même cause. Il n'en a pas été de même des tentatives partielles faites en pleine connaissance de cause par les propriétaires du pays: plus d'une spéculation profitable s'est réalisée sans bruit sur des points isolés.

“Le chemin de fer de Bordeaux à Bayonne traverse main-

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is he by any means the only landowner who has let and sold land expressly for the erection of alkali works.

“There is a general desire among alkali manufacturers to minimise the nuisance and injury caused by these works. Recent legislation has undeniably tended to that result, and any further legislation in the same direction that is reasonable and practicable will, I know, receive their hearty support; but it will be a fatal mistake if a somewhat onesided statement of local grievances should cause any hasty legislation that would destroy an industry that is absolutely indispensable to the manufacturing prosperity of the country.”

\* Pages 297–300.

tenant les Landes dans toute leur longueur, et y apporte la puissance de l'industrie moderne. La valeur des terres a immédiatement doublé, triplé même, le long de la ligne, et tout le monde comprend que la solution du problème n'est plus qu'une question de temps. Rien n'était possible dans un pays sans chemins et sans eau : la compagnie du chemin de fer s'est engagée à ouvrir sur plusieurs points des routes munies de rails en bois, et si en même temps on parvient à créer de l'eau salubre, soit au moyen de puits ou de citernes,\* soit au moyen de canaux dérivés des étangs, le plus difficile sera fait; le reste viendra de soi. La plus grande partie des terres incultes sera sans doute semée en pins, chênes et chênes-lièges, et pour accélérer cette transformation, une loi récemment rendue permet à l'État de boiser les terrains communaux jusqu'à concurrence de six millions de francs. Les autres branches de la culture ne doivent cependant pas être négligées, et il faut leur faire aussi leur part, car le danger des incendies, si grand pour des bois résineux sous un soleil ardent, ne permet pas de couvrir le sol d'une forêt immense et continue : une simple étincelle du chemin de fer suffirait pour mettre le feu de Bordeaux à Bayonne.

“Les Landes peuvent être aussi productives que quelque contrée que ce soit, mais elles conserveront toujours un caractère spécial. La singularité de cette nature sera un de ses charmes. Les régions inhabitées ne se prêtent que lentement à l'habitation de l'homme, et le régime pastoral, qui multiplie les animaux, et par eux les engrais, y sera longtemps, avec le régime forestier, le principal instrument du progrès. Quand on mesure par la pensée cette vaste solitude, qui s'étend jusqu'aux portes d'une de nos plus grandes villes, on s'étonne que la France ait pu songer à coloniser des pays lointains, au lieu de porter ses efforts sur elle-même. Si le dixième de ce qu'a coûté l'Algérie avait été dépensé dans les Landes, on aurait obtenu de meilleurs résultats, et l'on aurait épargné bien des flots d'un sang généreux; mais les stériles conquêtes de la guerre nous ont toujours beaucoup plus séduits que les créations fécondes de la paix. L'arrondissement de Mont de Marsan, bien qu'il renferme le chef-lieu du département, ne contient pas plus de 100,000 habitants sur 500,000 hectares, comme le Tel africain, et il s'y trouve plusieurs parties déjà très-peuplées et très-cultivées; dans

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\* “Il suffit, pour avoir de l'eau potable, de creuser des puits de cinq à six mètres de profondeur, avec des parois imperméables, et d'y introduire une couche de gravier. Chacun de ces puits coûte 600 francs. Les Landes en possèdent déjà une cinquantaine, et on calcule qu'il suffirait de 100,000 francs pour en doter toutes les communes qui en manquent.”

la Lande proprement dite, il n'y a pas plus de 10 habitants par 100 hectares, et quels habitants ! Cette terre, qui sera un jour populeuse et florissante, n'offre à l'œil qu'un spectacle de désolation : c'est le désert tel qu'on va le chercher au delà des mers, avec son triste silence, sa végétation chétive et ses horizons infinis.

“La tradition raconte que, quand les Mores furent chassés d'Espagne, à la fin du seizième siècle, ils demandèrent à s'établir dans les Landes, avec l'espérance de les fertiliser. Les préjugés politiques et religieux ne le permirent pas. Non moins civilisés à cette époque que beaucoup de peuples chrétiens, les Mores connaissaient d'excellents procédés de culture qui marquent encore leur passage dans les plus riches provinces de la Péninsule. Les Landes seraient probablement devenues productives entre leurs mains, et ce qui leur restait de la barbarie musulmane aurait reculé devant les idées modernes de tolérance et d'égalité. S'ils ont tant dégénéré en Afrique où ils se sont réfugiés, c'est qu'ils y ont trouvé les Turcs, le plus destructeur de tous les peuples ; cette civilisation a péri tout entière faute d'un asile où elle pût se développer. Mais le royaume qui devait bientôt révoquer l'édit de Nantes et expulser de son sein des Chrétiens et des Français, ne pouvait s'ouvrir à des enfants de l'Islam étrangers et persécutés, et ce qui a puissamment contribué à ruiner l'Espagne ne pouvait contribuer à enrichir la France.”

Leaving now the subjects of the introduction of foreign trees, and that of the unintentional destruction of our own, and taking up the subject of disforestation generally, I have to say that the literature of it has in these latter days become all but colossal ; and that the moral of it all is just the reverse of that of the capitulary of Charlemagne,\* where it is ordained that wheresoever any good men and true are found to be available they may have forest land given them for clearing : *ubicunque invenient utiles ullos homines iis detur silva ad extirpandum*. Two hundred and fifty pages of the second edition of Mr. Marsh's excellent work, 'The Earth as modified by Man's Action,' are devoted to this subject alone ; the bibliography extending over nine pages, prefixed to his work, is very largely made up of the titles of works bearing upon it ; and I hold in my hand a small, but closely printed, German octavo, which has some 280 pages devoted to the purpose of specifying the names and giving a few lines as to the scope of such works. Its own title is 'Die Bedeutung und Wichtigkeit des Waldes, Ursachen und

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\* Cap. secund. Anni 813, sive Capitul. xxi. ed. Stephan. Baluzius, 1677, tom. i. p. 510, De Villicis regii quod facere debent.

Folgen der Entwaldung, die Wiederbewaldung, mit Rücksicht auf Pflanzenphysiologie, Klimatologie, Meteorologie, Förststatistik, Förstgeographie und die Förstlichen Verhältnisse aller Länder, für Först- und Landwirthe, National-Oekonomen und alle Freunde des Waldes, aus der einschlagenden Literatur systematisch und kritisch nachgewiesen und bearbeitet von Friedrich Freiherrn v. Löffelholz-Colberg, königl. bayer. Oberförster.' Leipzig, 1872.

But in Herr v. Löffelholz-Colberg's list "aller Länder," there is no mention of India nor of its forest or other departments, nor of their annual reports, nor of the names of (1) Balfour, of Birdwood, (2) of Cleghorn, (3) of Dalzell, (4) of Danvers, (5) of Brandis, of J. L. Stewart, (6) of Colonel G. F. Pearson, or of Beddome, to each of whom, though unknown to me personally, I feel myself personally indebted. And extensive as is his bibliography, it admits of being supplemented by the specification not only of works which have appeared later, and in India, but of some of considerable importance which appeared earlier, and some of them in Europe of earlier date.\*

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\* For the Memoirs of the Indian authorities named above see:—(1) Revenue Department, No. 981, 1848; (2) Catalogue Bombay Products, 1862, and Journal Society of Arts, Feb. 7, 1879; (3) Sind Forest Reports, 1858–1860; (4) Journal Society of Arts, May 24, 1878; (5) Ocean Highways, Oct. 1872, and Systematic Works, p. 204; (6) Report on Forest Departments of India, 1872.

As regards other memoirs I find no mention of v. Baer's papers upon this very same question of the relation of woods to rainfall already referred to *supra*, in the 'Beiträge zur Kenntniss des Russischen Reiches,' iv. 1841, p. 190, xviii. p. 111, 1856. From the former of these two papers the following sentences may with some advantage be quoted, pp. 190–191:—"Noch viel weniger darf man glauben, dass nach dem Verhältnisse der Waldabnahme eines Landes auch die Wassermengen in seinen Flüssen abnehmen müsse. Es ist nicht unser Absicht den Einfluss ganz läugnen zu wollen; allein wir wollen nachdrücklich darauf aufmerksam machen, dass die Niederschläge aus der Luft nicht von den kleinern unter ihnen liegenden Localitäten abhängen, sondern von grossen ausgedehnten Verhältnissen, von vorherrschenden Luftzügen von der Quantität Feuchtigkeit welche diese Luftzüge mitbringen, von der Differenz zweier einander berührender Luftmassen, dass diese Niederschläge es sind, die unsern Flüssen Nahrung geben, dass in unsern Breiten sie in Form des Schnees mehrere Monate hindurch aufgespeichert werden und endlich, dass in einem so flachen Lande wie Russland die Feuchtigkeit welche in Form von Regen und Schnee niederfällt, aus sehr weiter Ferne kommen kann. Dass unsere Flüsse und besonders das Gebiet der obern Wolga in trockenen Sommern wenig Wasser haben, hat seinen Grund vorzüglich darin, dass hier kein Gebirge ist, an welchem Niederschläge das ganze Jahr hindurch nothwendig erfolgen und eben deshalb hat es ohne Zweifel von jeher einzelne Sommer gegeben, in denen das Wasser ungewöhnlich niedrig stand. Wir kennen Zeugnisse hierüber aus der Zeit Peters des Grossen, und ohne Zweifel wird man sie aus noch früherer Zeit finden wenn man darnach sucht."

And to supplement a second time the bibliography of Herr Löffelholz-Colberg, I will say that the following quotation from the well-known and accomplished writer of the sixteenth century, Bernard Palissy, may fairly take its place with the foregoing more strictly scientific opinion of von Baer. Mr. Marsh shall introduce it for us (*l. c.*, p. 303):—"In an imaginary dialogue in the 'Recepte Véritable,' the author, Palissy, having expressed his indignation at the folly of

I show you yet another work, an English Parliamentary Report, of date 1875, Feb. 1, respecting the Production and Consumption of Timber in Foreign Countries, from which a very large amount of most useful information can be procured for the very moderate charge of 11d., one penny less than one

men in destroying the woods, his interlocutor defends the policy of felling them by citing the example of divers bishops, cardinals, priors, abbots, monkeries and chapters, who by cutting their woods have made three profits, the sale of the timber, the rent of the ground, and the 'good portion' they received of the grain grown by the peasants upon it. To this argument Palissy replies: 'I cannot enough detest this thing, and I call it not an error, but a curse and a calamity to all France; for when forests shall be cut, all arts shall cease, and they who practise them shall be driven out to eat grass with Nebuchadnezzar and the beasts of the field. I have divers times thought to set down in writing the arts which shall perish when there shall be no more wood; but when I had written down a great number, I did perceive that there could be no end of my writing, and having diligently considered, I found there was not any which could be followed without wood . . . . And truly I could well allege to thee a thousand reasons, but it is so cheap a philosophy, that the very chamber-wenchies, if they do but think, may see that without wood it is not possible to exercise any manner of human art or cunning.'"—('Œuvres de Bernard Palissy,' Paris, 1844, p. 82, first published in 1563.

I may do well to neglect chronological order and mention the work by Dr. J. C. Brown, a Fellow of the Royal Geographical Society, which appeared in 1876 under the title, 'Reboisement in France; or Records of the Replanting of the Alps, the Cevennes, and the Pyrenees with Trees, Herbage, and Bush, with a view to arresting and preventing the destructive consequences and effects of Torrents.' Dr. Brown has besides this and other works on kindred or on the same subjects, given us a work on 'The Hydrology of South Africa, or Details of the former Hydrographic Condition of the Cape of Good Hope, and of Causes of its present Aridity.'

Professor Ernst Ebermayer's work, 'Die Physikalischen Einwirkungen des Waldes,' being the 'Resultate der fürstlichen Versuchs-Stationen im Königreich Bayern,' Aschaffenburg, is of later date (1873) than the bibliographical *précis* of Löffelholz-Colberg, and would not therefore have been referred to by that writer as it ought to be by all subsequent writers on the same subject.

Professor Karl Koch's 'Vorlesungen über Dendrologie,' one-third part of which is devoted to the subject of the "Influence of Woods on the Health of Men, and on Climate," is similarly of later date (1875) than the last edition of Mr. Marsh's 'The Earth as modified by Man's Action.'

Latest in order of time, but by no means last in order of merit, I must place Professor Wellington Gray's 'Notes on Tree-Planting and the Water Supply of the Deccan,' Aug. 1877, contained in the excellent 13th Annual Report of the Sanitary Commissioner for Bombay, Dr. T. G. Hewlett. The influence on climate of cosmical as compared with local agencies; of mountain and monsoon, that is, as compared with man's plantations; and on the other, the influence of the brute population of India, the goats and the camels, as compared with the agency of the human inhabitants, who besides employing the two organic means for destruction just now mentioned, also "hack, cut, and burn," will be found instructively, though briefly, discussed in this essay. I take this opportunity of adding to this bibliography the names of three books with the contents of which I was not acquainted when I wrote as above. They are:—

'Wald, Klima, und Wasser, von Dr. von Liburnan,' 1878. This little octavo is one of the Munich series of Science Primers, being Bd. xxix. of 'Die Naturkräfte, eine Naturwissenschaftliche Volksbibliothek.'

'Die fürstlichen Verhältnisse Frankreichs, von Dr. A. v. Seckendorff,' 1879.

'Der Wald im Nationalen Wirthschaftsleben, von Ph. Geyer,' 1879.

shilling—a fact which would have rejoiced the heart of the late Mr. Joseph Hume. If in addition to this work we had rendered available to us the usufruct of the vast experience recorded in the Blue Books of the Indian Forestry and Sanitary Departments, in a volume of anything like the same size, I do not say of anything like the same price, the India Office would add considerably to the very large claims it has established upon the gratitude and acknowledgments both of men of science and men of action by the publication of those invaluable volumes.

I do not propose, indeed I do not dare, to attempt to give a summary of the results of the very many volumes here alluded to, pleasant and even absorbing reading though many of them have proved themselves to be. I will not discuss the curious belief still prevalent in Spain, to the effect that trees breed birds, though somewhat similar articles of faith are not without adherents nearer home, merely observing, so that I may affront no one, that it would be truer to say that the destruction of trees leads to the banishment of birds, and thereby to the sexual, and in that sense spontaneous, generation of insects. Nor will I speculate as to whether the hatred of a tree, which you will be told in travelling in countries and districts at home and abroad (even in Sicily, see Fischer, *l.c.* p. 135), where the Celtic or other pristine ethnological element is still strong in the natives, is due to a hereditarily transmitted recollection of the days when, as the capitulary just quoted shows, man had to wage war against the forests, or a similarly transmitted recollection of the much more recent forest-laws and the feudal state of things contemporaneous with them. Neither, on the other hand, will I content myself with simply repeating Mr. Marsh's summing up of the matter in the short way which long words so often (literary critics notwithstanding) enable us to sum up the results of a long investigation, and saying with him that (p. 300, *l.c.*) the forest's "general effect is to equilibrate caloric influences and moderate extremes of temperature." But I will firstly, upon this occasion, repeat what I have often heard my late and much-lamented friend, Mr. Wm. Menzies, the author of the splendidly-illustrated book, 'Forest Trees and Woodland Scenery as described in Ancient and Modern Poets,' say, to the effect that England is after all as well wooded a country as probably any other civilised one in the world, adding that Sir John Lubbock has, as I think, either in some volume which he has contributed to science, or in some return which he has extracted from Parliament, established the same fact. And, remarking that if we couple with this fact the

consideration that this favourable numerical representation of trees is not due to the existence of large forests, we find therein an illustration of the working of certain peculiarities of our social and political condition as compared with those of other countries, which I leave to your consideration; I pass on, secondly, to say a few words as to the influence which trees exercise in the way of modifying climate locally by means of their leaves. Clearly this comes fairly under the title of my lecture. Man can cut down "the goodly fir-trees" and other trees too, "Laubholzer" as well as "Nadelholzer," of an entire country; he can burn them, and by his domesticated goats and cows and camels he can prevent their suckers and their seeds from replacing them by fresh plants. What consequences follow when the square area which a tree in full leaf represents is abolished? Firstly, whatever else may be disputed, there can be no doubt the loss of this square area means the loss of a very considerable area upon which dust and *particulate* matter can be caught and filtered out of the atmosphere. The more sticky the leaves, of course the more perfect the interception. And as modern investigations, such as those which Mr. John Simon, C.B., used to have carried on whilst in the Medical Department of the Privy Council Office, have taught all those who have ears to hear, even if not also eyes to see, that the germs of many or most infectious diseases are *particulate*,\* we can understand how

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\* We have such accounts from Ravenna and Beyrout; from the East and the West Indies, and from Guiana. Lord Mark Kerr (see 'Report on Measures adopted for Sanitary Improvements in India for June 1871 to June 1872,' p. 14) did much planting in Delhi in 1864, and, on coming eight years later to take stock of the effects of his hygienic work, was able to persuade himself that the almost entire disappearance of the Delhi boil was due to this particular cause. But the Indian Government had to report in the succeeding year's volume of the same series, p. 17, that they had not received from the authorities they had consulted "reliable data to warrant any general conclusions being drawn as to the effect of trees and vegetation on these sores." Still they proposed "to institute a more particular inquiry into the matter, and to submit a Report on the investigations in due course." Upon this subject something may be found in Mr. Menzies' 'Forest Trees and Woodland Scenery,' 1875, p. 101, *q. v. ibique ab ipso auctore necnon a me citata*. Since the appearance of Mr. Menzies' work the literature relating to the *Eucalyptus globulus* as an agency for "purging the unwholesome air" has attained a great development. Especially to be recommended is a paper, 'The Eucalyptus near Rome,' by Dr. R. Angus Smith, F.R.S., published in the 'Proceedings' of the Literary and Philosophical Society of Manchester, vol. xv., No. 9, pp. 150-164, 1876, as also some papers in the 'Edinburgh Medical Journal,' February 1878, and May 1879, pp. 1052-1053, by Dr. Bell. And what is better even than good memoirs, good progress has been made in the way of actually planting this tree by no less conspicuous warriors than Garibaldi in the Roman marshes, and by Sir Garnet Wolseley in Cyprus. I have not, however, heard of any further development of the use of the *Helianthus annuus* as an anti-malarious agent, nor of the adoption of Mr. Menzies' recommendations of the employment of the horse-chestnut, the sycamore, or the balsam poplar and white poplar for the same purpose. To the references given *l. c.* may



it is that from so many quarters of the world we have more or less well-established histories of belts or curtains of trees protecting towns from malarious and anti-sanitary influences.

Secondly, though doubt may be raised (*e.g.* by M. J. Bellucci *cit.* 'Athenæum,' March 14, 1874, p. 360) as to the giving off by trees of ozone into the air, there can be no doubt as to another mechanical effect besides the one already dwelt upon in the way of breaking the force and the fall of raindrops, and thereby preventing, *pro tanto*, the over-rapid flowing away of such rain and the over-violent washing away of the soil. Simple as this action is, it is, when coupled with the action of the roots and their spongioles to which it gives a fairer chance of coming into play, one of the most important which a tree in leaf exercises. Finely divided rain sinks into the soil, whilst rain which falls in larger masses runs off and forms torrents. The roots making up an interlacing fibrillar mass by their multitudinous divisions, entangle and detain the moisture which comes to them in capillary columns; and from the loaded sponge which they thus come to represent, they dole or issue out in rations the supplies necessary for keeping springs and streams in constant and perennial volume.\*

It is, I must say, a considerable marvel that upon a third function of that part of a tree which man can affect, either by his own hands or through the intermediation of his domestic animals with the greatest results in the way of mischief at the least cost of labour to himself, so much room for dispute and doubt should still be left open by the botanists. Upon this

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be added, as speaking in the same sense, Becquerel, 'Mém. Institut,' xxxv., 1866, p. 444, and Boudin, 'Géographie et Statistique Médicales,' vol. i. p. 229. Much has been written by the two last-named writers on the electrical action of trees; I will quote the following sentences from the latter of the two, *i. e.*, "Enfin le déboisement doit être considéré comme équivalent à la destruction d'un nombre de paratonnerres égal au nombre d'arbres qu'on abat; c'est la modification de l'état électrique de tout un pays; c'est l'accumulation d'un des éléments indispensables à la formation de la grêle dans une localité où d'abord cet élément se dissipait inévitablement par l'action silencieuse et incessante des arbres. Les observations viennent à l'appui de ces déductions théoriques."

\* It is of course possible to exaggerate the preventive power of arboriculture, as of other beneficial agencies. If a mountain is sufficiently high, and can be blown upon by sea breezes as yet undeprived of the full proportion of moisture which a warm latitude can give them, you will have *from time to time* destructive torrents rushing down their sides, however well wooded they may be. But what is an occasional occurrence only in a well wooded mountainous country, is a very common one in a district where the charcoal burner, the wood merchant, and the goat, have been allowed to have their wasteful will unchecked. Homer's lines, II. xi., 492-495, show that however striking the phenomenon he describes, it was nevertheless not so very common as the complaints with which so many of the Reports I have referred to prove it to be now in so many countries in Europe and elsewhere.

third function of the leaves, their power as evaporators, the most important perhaps of all their functions, both as regards the tree's own economy and as regards ours, it is little less than marvellous that a Professor of Botany should have to write thus in 1875. Professor Koch, however ('Vorlesungen über die Dendrologie,' 1875, p. 284), following Ebermayer, *l. c.*, p. 183, says: "The question of the evaporation of water through the tissues of a plant is very like the question in medicine of the treatment of diseases. The more there is written about a disease, and the more we have so-called infallible remedies recommended for it one after the other, the less do we get of any real knowledge of it. There is scarcely a single point in the life of a plant on which so much, and indeed often so much that is intrinsically self-contradictory, can be specified as having been written, as this point of evaporation. Whilst Unger, and indeed certainly with right on his side, owns that a surface of (so much?) water gives off by evaporation three times as much as (an equal surface of?) a tree, Schleiden says that on the contrary the tree gives off three times as much as the open surface of water." \*

It is true that Professor Koch goes on to say that nevertheless, as Sachs also has said, such observations and the results deduced from them have a scientific value. As it seems to me, they have not only a scientific value, as all observations which are reducible to weights and measures have, but that they have also a very distinctly appreciable practical value and applicability.

Anybody who will read the account given by my friend the Rev. Richard Abbay in 'Nature,' May 18, 1876, of the formation of a lake in a district in Australia, 150 miles from Sydney, and 2000' above the level of the sea, subsequently to the destruction of the woodlands round about a particular area of depression, will be convinced that this occupation by water of what had been habitable land was not only posterior to, but caused by, the disforesting operations of the various agents

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\* The German words, which I have not attempted to translate quite literally, are as follows:—

"Mit der Verdunstung des Wassers durch die Pflanze geht es, wie in der Medizin mit den Krankheiten. Je mehr über eine Krankheit geschrieben ist und je mehr nach und nach sogenannte untrügliche Mittel empfohlen wurden, um so weniger ist sie erkannt. Kaum möchte über einen Gegenstand im lebenden Pflanze so viel, und zwar oft einander widersprechendes, geschrieben worden sein, als über die Verdunstung. Während Unger, und zwar wohl mit Recht, behauptet, dass eine Wasserfläche drei Mal so viel verdunstet, als der Baum, sagt Schleiden, dass umgekehrt dieser drei Mal so viel verdunstet als die offene Wasserfläche."

specified, namely, squatters, grubs, cattle, sheep and opossums, not unaided by disease of the trees themselves. The surplus of water forming the lake corresponds to the enormous quantitative disproportion between the evaporating surface which it exposes when thus collected, and that which it would have exposed when dispersed through all the myriads of leaves which man and his allies had destroyed.\* It is not, however, necessary to take such a long voyage as that to Sydney to get an unmistakeable illustration of the evaporating power of leaves. This power can be illustrated *e contrario* by observing the construction on the treeless Yorkshire or other English wolds of the perennial so-called "dewponds." It is not even necessary to travel as far as the nearest down or wold to make this observation, and fill in the necessary details as to extent of feeding ground to catch, and puddled ground to hold, the rainfall. A very simple experiment with plants no farther to fetch than cabbages, will show, as Professor Wellington Gray tells us (*l. c. supra*, p. 10), that 3000 square inches of their succulent leaves will give off as much as a pint of water per diem.

It may, however, be fairly objected that the rate of evaporation observable in an isolated mass of leaves, or in a single isolated tree, does not give us a measure of the rate at which the same process will go on in a wood when the exposed and evaporating surface is relatively so much smaller. And this difficulty, which lies in the geometrical nature of the case, may account for the great discrepancies in the estimates which various writers have given of the amount of watery vapour given off by masses of wood.†

\* See also Ebermayer, *l. c.* pp. 184, 185.

† Professor Pfaff, for example (*cit. Ebermayer, l. c.*, p. 186), gives us 120 kilogrammes as the entire amount evaporated by an oak with 700,000 leaves, each of a square surface of 2325 mill. during the period from May 18 to October 24.

Vaillant (*cit. ibid.*) gives the amount of watery vapour given off by an oak of 21 metres height and 2·63 metres girth at a height of 1 metre above the ground, as 2000 kilogrammes on a fine day.

Hartig (*cit. ibid.*), the author of a 'Lehrbuch für Forster,' Stuttgart, 1861, calculates that a German morgen (= 2·3895 acres), carrying a thousand trees of nine different kinds of conifers and broad-leaved trees of twenty years planting, exhales daily during the period of vegetation at 3000 pounds weight of water.

Professor Prestwich, in his 'Water-bearing Strata,' 1851, p. 118, gives us as an estimate for the amount of watery vapour given off by the leaves of "a tree of average size" two and a half gallons per diem.

Mr. Lawes (*cit. in loc.*), from 'Journal of Horticultural Society,' vol. v. pt. i., 1850, gives us as a foundation for an estimate of the relations between the amount of water taken in by vegetable organisms, with the matters it held in solution, and the solid residue thence extracted and retained by the plants for its uses or for ours, a statement to the effect that three plants of wheat or barley gave off 1½ gallon, 250 grains of water for every grain of solid residue in the adult plant.

Hellriegel, on the other hand (*cit. Ebermayer, l. c.* p. 187), gives us as his

It must, however, be allowed that the cases in which the cutting down of trees, and the consequent putting into abeyance of the functions of their leaves, have been followed by the drying up of springs, are much more numerous, even if they are not better established, than those in which the reverse effect has been recorded, as by Mr. Abbay. The explanation of this apparently self-antagonising or capricious operation of the same primary cause is not far to seek. When a tree is cut down, the area once protected by its leaves is exposed to the uncounteracted action of the summer sun, and rainfall may run off it when thus hardened, just as it runs off an imperfectly thawed surface in the spring, or may sink away into chinks and fissures which that exposure may, and very often does, produce, and in either case such rainfall is lost to the summer-dried fountain. If the water thus thrown upon the surface, thus modified, finds its way into a basin properly proportioned as to cubical, as to square area, and as to water-holding power, we may have a lake formed, as in the case related above by Mr. Abbay. It is, of course, more usual to find one or other, or two or all, of these favourable conditions wanting, and in the more numerous class of cases we find that the diminution of wood and the diminution of water go hand in hand. I would go further than this, and aver that the diminution of wood and the diminution of water in the shape of ice may not only also go hand in hand, but may also be connected as cause and effect. M. Viollet-le-Duc, in his delightful work on 'Mont Blanc,' 1877 (translated by B. Bucknall, pp. 341, 353), tells us that "although the glaciers have been tending to diminish for the last forty years in a somewhat rapid ratio, which would seem to indicate an elevation of the mean temperature, the forests are quitting the heights where they still lingered, to take a lower position. Is there any connection between these two results? We shall not endeavour to solve the problem." It is a little presumptuous to address one's self to it after this deterrent warning. Still M. Viollet-le-Duc has (*l. c.* pp. 339, 377) shown us that the destruction of the forests is abundantly explained irrespectively of any inorganic agency by the mischievous action of man working as a goatherd and a woodcutter. His descriptions of these operations are couched in language of real pathos and eloquence, but scientifically it shows us that we need not look for any other cause for the disappearance or

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estimate that for the production of 1 lb. of dry barleycorns, 700 lbs. of water, inclusive of the water evaporated from the soil, are all that is necessary, and that other cerealia have their demands limited within somewhat similar proportions. *Intervalla vides humanè commoda.*

shrinking of the limits of the forests. The spruces and the larches, for such are the trees, being thus destroyed by the "essentially destructive power" of man, how can their destruction be shown to entail the diminution of the glacier? I think the loss of these trees as evaporating agencies may be taken as a *vera ac sufficiens causa* for the diminution. A great deal of great interest has been written \* upon the difference in the amount of watery vapour given off by various trees and by the cerealia, which last, and amongst which last, as might be expected from their deep roots and the amount of their *Stoffwechsel*, wheat-plants stand quantitatively pre-eminent. But for our present purpose it is sufficient to point out that the rays which strike on the mass of a glacier are, to say nothing of the other conditions of disadvantage which such a mass opposes to them, enormously *outnumbered* by the rays which strike on the needle-shaped leaves of an adjacent wood of ordinary acreage, made up of such trees as the spruce or the larch; and the vapour which is thus set free into the entire circumambient atmosphere alike of glacier and of wood, acts most potently in several ways in the direction of saving the glacier from wasting.

On the other hand, great as the influence of the evaporating power of trees and forests may be shown to be in some directions, it is possible enough to overrate it as regards such more than localised matters as the increase of the rainfall. "It is," says Dr. Brandis ('Ocean Highways,' Oct. 1872, p. 204), "a widely spread notion, entertained by many writers who are competent to judge, that forests increase the rainfall, and that the denudation of a country in a warm climate diminishes its moisture. Much of what is known regarding the history and the present state of the countries round the Mediterranean seems to support this theory, but it has not yet been established by conclusive evidence." The important point seems to be that in *mountains* this influence may count for something considerable, whilst in the plains, howsoever well wooded, trees can act only as do other good radiators in the way of precipitating not wind-borne moving vapour, but simply dew.

Mr. N. A. Dalzell, in the Report on the Sind Forest for 1859-1860, observes (par. 31): "Although it would be too hardy an assertion to say that the existence of forests in Sind causes any increase in the fall of rain, they certainly do so on the summits and tops of mountains;" and par. 35: "In enumerating the benefits derived from forests, I make here no use of the fact that forests attract rain-clouds, because I do not think it appli-

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\* See Vogel, Pfaff, and Hartig. *citt.* Ebermayer, l. c., p. 185.

cable to plains, and because it is not yet clear that causes are not mistaken for effects, that is, whether it is the rain produces forests, or forests which produce rain; and certainly no inhabitant of Sind would consider it legitimate to decide that because a country is covered with wood, therefore it is wet." It is satisfactory to be able to add that the result of Professor Ebermayer's prolonged observations in Bavaria has brought him to the same conclusions as those of Dr. Dalzell, carried on in the very alien surroundings of Sind. Dr. Ebermayer's words on this subject, used in summing up the results of his researches, are (*l. c.*, p. 202): "Auf Grund unserer Untersuchungen, glauben wir daher besuchigt zu sein annehmen zu dürfen, dass in Ebenen von gleichern allgemeinen Charakter der Einfluss des Waldes auf die Regenmenge jedenfalls sehr gering ist, und dass er auch auf die procentische Regenvertheilung keine Einwirkung hat. Mit der Erhebung über die Meeresoberfläche nimmt die Bedeutung des Waldes bezüglich seines Einflusses auf die Regenmenge zu, er hat desshalb im Gebirge einen grosseren Werth als im Ebenen. Im Sommerhalbjahr ist die Einwirkung des Waldes auf die Regenmenge viel grosser als im Winterhalbjahr."

Whatever the physical principles involved are, anybody may find beautiful illustrations of them, who will observe in a mountainous district how—

"The swimming vapour slopes athwart the glen,  
Puts forth an arm and creeps from pine to pine,  
And loiters slowly drawn."\*

or how

"The light cloud shoulders on the summer crag."†

recollecting that the phrase "Rauchen der Walder" is used for the similar phenomenon when produced by trees, or who will finally in a lowland or other country stand and study the frost as it hangs itself on to such a tree as the birch often long before it has begun to whiten the ground around it.

[Since writing as above, the 'Observations Météorologiques faites de 1877-1878,' by M. Fautrat, published by the French "Ministère de l'Agriculture et du Commerce: Administration des Forêts," 1878, have come into my hands. This author, with the results of M. Mathieu's eleven years' observations at Nancy (for which his 'Météorologie Comparée Agricole et Forestière,' published under the same auspices, February 1878) before him, as also the results of four years' observations in the Forest of Halatte, and of three years in the pine-woods of Ermenonville, has come to the following conclusions.

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\* Tennyson, 'Ænone.'

† Tennyson, 'Edwin Morris.'

i. That when it rains more rain falls over a wooded than over a non-wooded area, and that whilst trees of all kinds possess the powers of condensing vapour, broad-leaved trees produce less effect than is produced by the narrow-leaved Coniferæ (pp. 14 and 16).

ii. That as regards the hygrometric condition of the air, the air over a wooded area contains more watery vapour (p. 18) than an unwooded area, but that the coniferæ have more watery vapour in their circumambient atmosphere than the broad-leaved trees. M. Fautrat expresses, or rather expands, this fact in the following words:—"If the vapour dissolved in the air was visible as are mists, we should see the forests surrounded with a vast screen of moisture, and around the Coniferæ this envelope would be more marked than over the broad-leaved trees. What is the source of this vapour? Does it come from the soil; is it the result of evaporation from the leaves, or is it due in the Coniferæ to the action of the thousands of points which the whorls of their leaves develop every year? *This is a complex question which the present data of physical science do not enable us to answer.* One thing one can say, and that is that the transpiration of the leaves cannot by itself produce this phenomenon. For, as a matter of fact, the transpiration in Coniferæ is less active than it is in broad-leaved trees. This fact has been made clear by M. Grandeau in his 'Essais historiques et critiques sur la Théorie de la Nutrition.' (M. Fautrat might have added, "as also by Hales *cit.* Boussingault, 'Ann. Chim. et Phys.' sér. v. tom. xiii. 1878, p. 314, and Sachs, 'Handbuch Exp. Physiologie Pflanzen,' 1865, p. 225.") It then follows that if the vapour of water dissolved in such great abundance in the atmosphere enveloping the pines was the result of the evaporation of the trees, this phenomenon ought to be much more striking over the mass made up by the broad-leaved trees than in that made up by the Coniferæ, whilst observation shows that exactly the contrary is the actual fact. We must therefore ascribe to the soil and to *other unknown causes* this remarkable property which pines have of attracting watery vapour." If it had appeared from M. Fautrat's tables that this excess of watery vapour was more marked in rainy than in dry times, it would have been easy to explain the fact by figuring to ourselves the all but infinite area which the fine films of water clothing every needle-shaped leaf of a coniferous tree would make up and offer for evaporation. For the leaves of our common Coniferæ wet readily; and it is owing to this property I apprehend that they intercept as much as one-half the rain which falls upon them before it

reaches the ground, whilst broad-leaved trees intercept but one-third. But, as it appears, the Coniferæ possess the hygro-metric advantage independently of the rainfall. And I have to say that the phenomenon in question needing, as it thus confessedly does, some additional explanation besides and beyond that which our usually accepted views furnish, appears to me to become more intelligible by reference to the theory as to "The Cause of Rain and its Allied Phenomena," which was put before the world in 1839, and subsequently published in a separate volume twenty years later by Mr. G. A. Rowell. This theory may I think be stated as follows, the author of it having slightly modified it in 1872, and restated it in a 'Brief Essay on Meteorological Phenomena,' published in 1875. He supposes that the molecules of watery vapour are completely enveloped in a coating of electricity to which they owe their buoyancy. This coating and this buoyancy he supposes to increase and decrease in ratio with the temperature of these molecules. Efficient conduction therefore of electricity will suffice on this theory to precipitate watery vapour either as rain, or as dew, or as mist. And I apprehend that Mr. Rowell would, in accordance with his own theory, look upon a fir-tree when shrouded, as M. Fautrat has described it, with a differentially thick envelope of vapour, as having thus clothed itself by virtue of the attractive effect of its myriad points. For electricity tending constantly to an equal distribution, so fast as the surcharge of electricity on the particles of vapour nearest the trees was carried away, so fast would the balance be redressed by supply from the particles more distally placed. And thus in accordance with this theory, particles of watery vapour would be constantly setting in the direction of the conducting and attracting leaves and twigs. Becquerel's view, already quoted, according to which the plague of hail which has so often \* been observed to follow upon the destruction of the woods of a country, is to be ascribed to the loss of the lightning-conductors which the cut-down trees represented while standing, and to the absence consequently of the incessant

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\* See a really pathetic account of this given as having been produced during his seven years' absence from Thüringen by Fischer at p. 164 of his charming 'Beiträge zur physischen Geographie der Mittelmeerländer,' 1877. Rain and hail-storms had become frequent, and the fishing brook had disappeared together with the wood of his boyhood. He adds:—

"Ich will gewiss damit nicht sagen, dass in jenen Gegend jetzt auch nur ein Tröpfchen Regen weniger falle als früher, obwol auch das örtlich möglich, ja wahrscheinlich ist, aber der Vertheiler und Bewahrer der Feuchtigkeit fehlt und so können locale Ursachen zeitweilig Wirkung haben, die in Sud-Europa allgemeinen kosmischen, aber durch örtliche verstärkten zu zuschreiben est. Ich wurde recht lebhaft an Sicilien erinnert, aus dem ich eben heimkehrte."



though insensible dissipating agency of the trees, appear to me to show that he at least would have allowed that Mr. Rowell's theory contains some, at least, of the elements of the true and complete theory of rain. It is not for me to meddle with memoirs in which neither living animal nor living vegetable organisms are concerned, otherwise I might have referred to Lord Rayleigh's paper in 'The Proceedings of the Royal Society,' March 13th, 1879, pp. 406, 409. But as regards the views they brought forward, and to a considerable extent as regards the whole question, I scarcely feel myself to be in a position to give any decided opinion.

That trees, like other beneficent agencies, do not fail to benefit themselves whilst thus benefiting the world at large, may be well gathered from the following passage from Professor Grandeau's work now in course of publication, "*Chimie et Physiologie appliquées à l'Agriculture et à la Sylviculture*, 1879, Pt. I. la nutrition de la plante." In summing up at p. 340 the results of his experiments, and after saying that the simplest and at the same time the best way of isolating a plant for purposes of experiment from the action of electricity, is to place it either under a metallic cage with large meshes, or *in the perimeter of a tree*; M. Grandeau proceeds as follows:

"2° Les végétaux et en particulier les arbres, soutirent à leur profit l'électricité atmosphérique et isolent aussi complètement qu'une cage métallique la plante qu'ils dominent.

"3° L'isolation produite par un arbre élevé peut s'étendre notablement au delà du périmètre foliacé de l'arbre.

"4° Une plante soustraite à l'influence de l'électricité atmosphérique subit, dans son évolution et dans son développement, un retard et une diminution très notables. Dans mes expériences, les quantités de substance vivante produite par les végétaux isolés ont été inférieures de 30 à 50 p. 100 à la production à l'air libre. La transformation du protoplasme chlorophyllien en glucose, en amidon, etc., paraît être tout particulièrement influencée par l'électricité atmosphérique.

"5° La floraison et la fructification subissent des modifications non moins grandes; sous cage isolante et sous les arbres, le nombre des fleurs, des fruits et le poids des graines ont été inférieurs de 40 à 50 p. 100. L'arrêt dans l'assimilation semble porter tout d'abord sur l'élaboration des principes hydrocarbonés.

"6° Le taux centésimal de substance sèche et le taux des cendres sont plus élevés en l'absence de l'électricité, les végétaux qui croissent hors cage s'étant constamment montrés

plus riche en eau et plus pauvres en matières minérales que la plante de même espèce sous cage isolante.”

M. Celi's adaptation of one of Sir W. Thomson's apparatuses as an “Appareil pour expérimenter l'action de l'électricité sur les plantes vivantes,” *cit.* and figured by M. Grandeau *in loco* from ‘*Annales de Chimie et de Physique*,’ ser. v. tom. xv., October 1878, is well worthy of inspection in this connection.]

The next part of my Lecture will be devoted to showing by the aid of three maps and one statistical table, how greatly man has modified the external aspect of the world he lives in by the introduction into the several parts of it of cultivated plants and domestic animals, previously, of course, unknown even in the wild state, to such areas of its surface. The maps by their colours show the areas on which the parent stocks of the most valuable and now most widely spread of these acquisitions have, with more or less of approach to demonstration, been shown to be indigenous. The short table of statistics tells you in its second line that one-half of all of them came from one single “quarter” of the globe, or in the language of modern zoogeographers from one single zoological “region.” The table and the maps taken together show us how largely some quarters of the globe have been benefited by borrowing from others, or in the language of my subject, how largely they have been modified by man's interference.

The first of these maps is very closely similar to the one which shows on Mercator's projection the now more or less generally accepted zoogeographical regions of the earth's surface, the Palæarctic, to wit, the Ethiopian, the Oriental, the Australian, and the two regions of the New World, the Nearctic and the Neotropical; as given by Mr. Sclater, and in Wallace's great work on Geographical Distribution.

The second of these maps is an enlargement of that given by Professor Huxley in the ‘*Journal of the Ethnological Society of London*,’ June 7th, 1870, to illustrate and embody his views on the distribution of the principal modifications of mankind. This map, besides other useful purposes, serves specially that of limiting off, by a special colouration, a particular portion of the vast Palæarctic region which is specially important to the subject in hand, as it was either actually upon it, or upon regions closely adjacent to it within that region, that the parent stocks of the moiety of our cultivated plants and domesticated animals may either be found still living or may reasonably be supposed to have existed formerly. The particular subdivision of the Palæarctic Region

has been coloured in a particular way by Professor Huxley, so as to indicate that upon it his "Melanochroic" or dark-white variety of our species was living not in perfect purity of stock, but more or less peacefully intermingled with the Mongoloid and with his "Xanthochroic" or fair-white varieties. The area thus occupied occupies itself on the map a district something of the shape of a tuning-fork, the two arms of which would form the northern and southern boundaries of the Mediterranean eastward from the longitudes of Albania and Tripoli; and would be carried by a broad base extending from the Caucasus over Syria and a part of north-west Arabia to the Red Sea, whilst its stem would cover Kurdistan, Khorassan, and North Persia, and end by bifurcating at a spot near Peshawur. The importance of this area is illustrated by the fact that a region very closely corresponding, if not quite coincident with it, is marked out upon quite different principles in the next map. A coincidence of much less intricacy, and therefore of much less cogency, though still not without a certain curious significance, is furnished to us by the fact that a certain island of blue colour, placed by Professor Huxley in the "Dark Continent" of Africa to indicate the presence in Upper Egypt, Nubia, and Abyssinia, of some traces of the Australioid type, corresponds with the area in that continent whence most or all of her few gifts of valuable cultivated plants and valuable domesticated animals have come to us, viz., the cotton plant; and, very probably, the date-palm; the ass, from the native stock *Asinus tæniopus*; and the cat, from the native stock *Felis maniculata*.

Of the two arms, into which the eastward end of this area bifurcates, the upper or northward one, would correspond with the Kuenlun range; and the southward with the Himalayas; Ladak, and part of the table-land of Thibet, lying between them. It is in the Kuenlun range that Jade mines are found.

The third map, being one of Johnston's charts of the World on blank Mercator's Projection, has been coloured so as to illustrate the following facts in the distribution of certain plants and certain minerals connected with the ancient development and subsequent progress of human civilisation. One region is coloured as it is in the 'Plantgeographisk Atlas,' tav. ii., of Professor Schouw, Copenhagen, 1824, so as to show the distribution of the *Vitis vitifera* over the countries forming the northern and southern shores of the Mediterranean and Black Seas, over Asia Minor, Palestine, and Mesopotamia, over the lowlands both of Astrakhan and Turan, and along the southern slopes of the Himalayas, so as to end at the eastern extremity of that chain. In nearly the same latitude as that eastern extremity, and

about in the same longitudinal line as the long axis of the Peninsula of Malacca, a spot of another colour marks the situation of the amber mines of Burmah,\* while four spots of yet a third colour in British Burmah, Banca,† Celebes, and Khorassan,‡ respectively indicate localities in which copper and tin are still found in such proximity to each other and in such accessible abundance as to suggest that it is not improbable that in some one of those districts prehistoric man may have come upon the invention of bronze. A fourth colour marks the position of the Kuenlun Jade mines,§ whence, in still earlier than bronze times, stone weapons may with great probability be supposed to have been procured by man before he migrated into the jadeless regions westward.

The New World was coloured as it is in Schouw's *tav. viii. l. c.*, to show the area of distribution of the Cactaceæ, a region comprehending South America north of the Tropic of Capricorn, the Isthmus of Panama, the Peninsula of California up to 30° N. lat., the West Indian Archipelago, the northern shores of the Gulf of Mexico, and the strip of gulfstream-washed North American coast between the Alleghanies and the Atlantic up to about 40° N. lat. From this area more than 25 per cent. of all our cultivated plants have been procured, as the annexed table shows; and, of course, since the time of Columbus.

This table (based, so far as it deals with the vegetable kingdom, mainly upon De Candolle's '*Géographie Botanique*,' pp. 986-987) gives approximatively the proportions in which the several "regions" of the globe established by that phytogeographer and by several zoogeographers, have contributed to make up the lists of such cultivated plants and domesticated animals respectively as are of considerable, even if not always of cosmopolitan, importance.

\* For the Amber mines of Burmah see Balfour's '*Indian Cyclopædia*,' s.v., 1871; and Keith Johnston's '*Royal Atlas*,' map 28, *in loco* lat. 26° 20'.

† For the existence of tin together with copper in Burmah see Mortillet, '*Révue d'Anthropologie*,' i. 1875, p. 653.

‡ For the similar collocation of the two metals which when combined make bronze in Khorassan and elsewhere in Central Asia south of the Caspian, see v. Baer, '*Archiv für Anthropologie*,' ix. 4, p. 262, 1877. We know from the same irrefragable authority, *Bulletin Acad. Sci. St. Pétersbourg*, tom. xvii. p. 417-431, 1859, and tom. i., 1860, pp. 35-37, that the date-palm is still represented a little to the north of these deposits of tin and copper, at Sari, in the as yet Persian province of Mazanderan on the south shore of the Caspian. This tree is supposed to have been carried thither, as to so many other places, by the Arabs during their career of conquest, which contrasts to such advantage and in so many ways with that of other Mussulman conquerors.

§ For an account of the Jade mines in the Kuenlun Range see Cayley, '*Macmillan's Magazine*,' October 1871; and for Jade generally, Rudler '*Popular Science Review*,' October 1879.

## Of (approximately) 160 Cultivated Plants.

## Of (approximately) 21 Domestic Mammals.

	Per cent.	Per cent.
The Palaearctic species are ..	50	50 are Palaearctic.
„ Oriental ..	25	14 „ Oriental.
„ African ..	25	14 „ African.
„ Nearctic ..	2.5	0 „ Nearctic.
„ Neotropical ..	25	14 „ Neotropical.
„ Australian ..	0	0 „ Australian.

Of some of the great facts which these maps and this table put before you, half diagrammatically, the anthropologists, zoologists, and geographers\* of the last quarter of the last

\* Pallas, Betrachtungen über die Beschaffenheit der Gebirge: an Address delivered Jan. 23, 1777. Zimmermann, 'Geographische Geschichte,' Bd. i. p. 114, 1778—Bd. iii. p. 250, 1783. Link, Die Umwelt und das Alterthum, i. p. 243 seqq. 1821.

There is perhaps no need for me to apologise for quoting the exact words of Pallas's Discourse, the less so as, though it appeared in two forms, one German the other French, within a year of its being delivered, it is not, I think, a very common book. The issue which I quote from is that of 1778, the year in which his *Novæ Species Glirium* appeared, six years later than the year in which the second volume of his *Spicilegia* with its wonderful *Fasciculus* XI. was published.

The difficulty in reading Pallas is to understand how his writings can bear the date they do. But he shall speak for himself:—"In den mittägigen Thalern dieses alten Landes muss man das erste Vaterland des menschlichen Geschlechts und des weissen Menschen suchen, die von dort in ganzen Nationen die glücklichen Gegenden von China, Persien und besonders Indien bevölkert haben, dessen Einwohner nach dem allgemeinen Geständniss unter allen Nationen die ersten gesitteten waren, und wo man vielleicht die Stammwurzeln der ersten Sprachen in Asia und Europa suchen muss. Selbst Tybet, eine der höchsten Gegenden Asiens dessen Einwohner, ihrem Vorgeben nach, von einer Ort Affen welche dieses Land zuerst bewohnten, abstammen (mit welche sie auch ohnedem einige Aehnlichkeit haben) Tybet hat die Verfeinerung seiner Sitten jenem Lehrern zu danken, die aus Indien dahin kamen." Pallas adds as a note to this passage, "Ich kann nicht umhin, hier zu bemerken, dass alle, so wohl in den nordischen, als in den mittägigen Ländern von dem Menschen zu Hausthieren gezügte Gattungen, in den gemässigten Erdstrichen des mittlern Asiens ursprünglich wild gefunden waren, das einige Kameel ausgenommen dessen beyden Abartungen nur in Africa gut fortkommen." Pallas then proceeds to instance the wild ox, the buffalo, the wild sheep, the Bezoar goat and the Ibex, from a crossing of which he supposes our common domestic goat to have arisen; the wild boar and, as I believe, incorrectly, the wild cat (*Felis catus*), as being the parent stocks of their domesticated namesakes, and having their original homes in the mountains which occupy Central Asia and a part of Europe. He adds, "Das zwey buckelige Kameel ist in den grossen Wüsten zwischen Tybet und China noch wild vorhanden." Prejevalsky's "From Kulja across the Tian-Shan to Lobnor" will be familiar in its English translation to most of us; his account of the wild camel is not more interesting as compared with this remark of Pallas' than in his account, p. 38, of the devouring of apples and apricots on the northern slopes of the Tian-Shan by wild boars, goats and deer, when compared with Tournefort's words ('Voyage du Levant,' Amsterdam, 1718, 4. t. 2, p. 129, cited by the Botanist Link, l. c., p. 234) describing a country which he visited and found to be "Ein Land erfüllt mit natürlichen Weinbergen und Obstgärten wo Nussbäume, Aprikosenbäume, Pflsichbäume, Birnbäume und Apfelbäume von selbst wachsen. Er setzt hinzu, man kann nicht zweifeln, dass hier einer von den Theilen Georgiens ist, wo, nach Strabo, alle Arten von Früchten in Ueberfluss sind, welche die Erde ohne Cultur hervorbringt."

century and the first third of this had possessed themselves; and following, at whatever distance, the great Pallas, they insist upon the strength of the claims of that portion of Central Asia whence issue the great rivers Ganges and Indus, Tigris and Euphrates, and which they speak of as "*den grossen Buckel Asiens*," to be considered as the primitive home of man, mainly as it was, according to them, the original home of *all* our domestic animals and so many of our cultivated food-plants.

These writers and discoverers slightly overstated their case when they said that *all* our domestic animals could be referred to parent stocks indigenous to that region, though, as will be shortly shown hereafter, it would have been little beyond the truth if, instead of saying all the domestic animals absolutely, they had said all the domestic animals *which are absolutely indispensable to modern man's comfort and progress*. But their case for their particular thesis would have been greatly strengthened if they had known that jade in the form of stone implements had accompanied man together with the goat into Western Europe, and was found no nearer to the Swiss Lake Dwellings, than are the Kuenlun mines pointed out on my map; if they had known that copper and tin could have been smelted together into bronze so readily either in Khorassan or in Burmah; if, to put however injudiciously, my weakest point last, they had also known that amber—such a frequent accompaniment of prehistoric man—also lay within easy reach of his curious hands in this latter country. But prehistoric archæology has till lately made but little advance since the time of Lucretius. Decandolle ('*Hist. des Sciences et des Savants*,' p. 263, 1873), indeed, classes it as a discovery as new and as great as five others of the twenty or thirty years previous to 1873, viz., spectrum analysis, convertibility of force, the greater extent of glaciers in geological times, natural selection, and the alternation of (animal) generations; and the writers referred to knew not, and could not have known, the whole strength of their position. As regards my present purpose it is, in these but little later days, superfluous to point out how the discovery of mines whence pre-historic man must, or at least might, have furnished himself with his weapons, implements, and ornaments, actually upon or along the same mountain ranges, spurs, and valleys in which he must, or at least might, have found in a wild state the animals which he has now around him as neces-

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Georgia lies some distance away from Lobnor, but both alike lie well within the great mountain system with its outliers which is called "*Asiens Buckel*" by the other writers, as also I apprehend within the modern "*Steppengebiet*" of Grisebach.

sary and universal elements in his own social life, bears upon the extent, as measured by latitude and longitude as well as by other gauges, to which the world has been modified by his migrations and importations.

Let me now enumerate the twenty domesticated mammals which we possess, and which for practical purposes may be taken as making up a tale of about twenty or twenty-one; let me specify which amongst them belong, as regards their origin, to the Palearctic region, and to the restricted portion of it already dwelt upon and defined, as the maps show you; and thirdly, leaving considerations of locality and of number, let me contrast the value of the nine, ten, or eleven mammals which man domesticated in that district with that of the others acquired from\* or contributed by all the other regions of the globe taken together.

Our twenty-one chief domesticated mammals may be enumerated in something like order of merit and necessity to us as follows: the dog, the cow, the sheep, the pig, the horse, the cat, the goat, the ass, the camel, the dromedary, the buffalo, the alpaca, the vicugna, the reindeer, the zebu, the banteng, the yak, the ferret, the rabbit, the mongoose, and the guinea-pig, omitting some few species the importance of which as being locally limited to very small areas, and as consisting of individuals numerically few, is too small to make it necessary to notice them. Representatives of more than one-half of this list can be fairly claimed by the Palearctic centre of creation as owing their parentage to stocks native to its soil; this half consisting of the dog, the cow, the sheep, the pig, the horse, the goat, the camel, the dromedary, the reindeer, the ferret, and the rabbit. I have said "representatives" of one-half of this list because it is more than probable that some of our breeds of domestic dogs and of pigs may have been reclaimed from wild parent-stocks in other regions of the world. There can, however, be no reasonable doubt that the great majority of the domestic breeds known till comparatively recent times in Europe, of each of those two animals, the dog and the pig, were drawn from parent-stocks living in the Palearctic Region, and this is all that is necessary for my present argument.

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\* It is a curious point in mythology that, so far as my memory serves me, no god nor demigod should have the credit assigned him of having domesticated any animal except the horse. Of course this fact, if fact it be, shows two things with more or less probability; firstly, namely—that these acquisitions were made in very far-off times, not merely in "the ages before morality" but in those much earlier ones, "the ages before history;" and secondly, that the acquisition of the horse was made in later days than the domestication of the other animals in question.

As regards the ox, the sheep, the horse, and the goat, I cannot think that with our present knowledge of zoogeography there can be any question that their parent-stocks were Palaearctic animals; and I am further prepared to express my belief that further investigation will render it highly probable that it was in that particular though very extensive part of the Palaearctic Region spoken of vaguely as "Asiens Buckel," or "Hoch Asien," and comprehending portions of all the great mountain ranges from the Caucasus proper to the northern side of the Hindoo Koosh, and from the Taurus to the Altai Mountains, that these several parent-stocks were brought under the influence of domestication. Wild animals are still to be found in some one or other or in several spots within that area from which we have no *à priori* reason for doubting that man might in the course of ages have educated the three last-named of the four domestic animals, the ox, the sheep, the horse, and the goat; and that a wild ox existed in the regions in which the Old Testament writers lived, not only their writings, but the Assyrian sculptures, and not only the Assyrian sculptures, but geological remains testify. The case, however, for the ox, having been first domesticated in Central Asia, is the weakest of the four, and it may be well to take it first. The Rev. Wm. Houghton has in his memoir on the domestic mammalia of the Assyrian sculptures ('*Trans. Soc. Bibl. Archæology*,' v. i., st. i., p. 2, 1876, and *ibid.* 1877, p. 54) given us a very spirited drawing from one of the Assyrian sculptures representing the hunting and the killing of the wild ox. What is of special value in this sculpture is for our purpose the presence between the shoulder-blades of a hump, which is present in so many other of the larger Ruminantia, but which, as Mr. Houghton remarks, reminds us of the Indian zebu, and of the fact that there are no specific differences between these two oxen underlying their soft parts. There can be no doubt that the figure is intended to represent a wild animal. The Accadians, who were in the habit of giving names to animals which referred to the countries whence they obtained them, gave names to the ox, which Professor Sayce thinks must refer to the country between the Euphrates and Syria and to Phœnicia. The bulls of Bashan, and possibly of the Taurus range, may be rightly recalled to our memories by these names. The European names for the ox, on the other hand, are said by M. Joly (*cit. Isidore St. Hilaire*, '*Hist. Nat. Gen.*' iii. p. 89) to have an Asiatic origin, and M. A. Pictet ('*Des Origines Indo-Européennes*,' pp. 330-343) has declared his views to the same effect. This, however, is only what would have been expected in the European languages of the Aryan division.



What is of importance as regards the domestication of the ox is to note that though such languages as the Finnic may use loan words taken from Aryan tongues to express the general idea of Ox (= Bovine animal), they frequently have true Turanian vocables to denote such particularities as we have in view when we speak of heifers, calves, cows, bulls, and the "ox," *sensu strictiori*, confirming in the last matter the statement of Strabo (vii. 4, 8) that castration was learnt from the eastern Europeans and Sarmatians. There is in fact a good deal of evidence for a view which should hold either that the Turanian races domesticated the wild ox, or rather the wild calf, independently; or that the human species did this great work before the differentiation into Aryan-speaking and Turanian-speaking men was carried out. That the Scythian breed of cattle should have been hornless in the time of Herodotus (iv. 29) appears to me to be explicable, not on the hypothesis taken up by later observers that it is an effect of cold, but as being a result of long-sustained domestication; and if what Hehn, p. 413, *l. c.*, suggests as to the South Russian breed of small red steppe cattle being descendants of those Scythian oxen is true, we should have a further confirmation of this view furnished in their persistency. There is, at any rate, another breed of cattle in the South Russian steppes, which goes by the name of the "Kalmuc" cow, and is supposed to have accompanied the Mongolian or Tartar hordes in their invasion of Europe.

Some writers, in defiance of the arguments that have just been glanced at, and of many others, have advocated the claims of Africa to be considered the parent country of the domestic ox. The main fact, as it seems to me, which has induced or seduced them rather into this conclusion, is the great extent to which bovine culture has developed itself through the length and breadth of the "Dark Continent." But without wasting words in pointing out the curious conclusions to which this reasoning would lead us in other cases, I would refer such persons to Middendorff's account of the development which this same bovine culture has attained in Siberia, and to his statement that not only have the nomads of the southern steppes, the Buráts, the Mongols, and the Kirghiz, herds numbering thousands and tens of thousands wintering out in the open, but that even the Jakuts by, it is true, taking more care of their cattle, have, from being simply nomads, become a pastoral people of distinction, and even "improved cattle-breeders!" ('Sibirische Reise,' iv. 2, 2, p. 1323.)

Coming, in the second place, to the consideration of the sheep, I must allow that considerable hesitation has been expressed by

many writers as to the question of its parent-stock; and that doubt may be not altogether unreasonably felt as to whether that stock may not have become extinct, as the parent-stock of the cow has all but entirely done. But what I know of the deerlike agility and watchfulness of some of our European mountain breeds of sheep, and in the second place what I see of the smaller size of the animal as giving it a less severe battle to fight for its survival, makes me slow to think that their parent-stock need be thought likely to have perished as has that of the larger ruminant. And setting this view aside, we may say that either the Mouflon (*Ovis musimon* and *cyprius*), with a range from Majorca to Cyprus, and not without footings, occupied by such varieties as *Ovis orientalis*, and *Ovis Vignei*, on the mainland on various points of the mountain-ranges of the Taurus and of Armenia to those of Tibet; or the Argali, *Ovis fera Sibirica* s. *Ovis Argali*, with an all but equally extensive range from the Pamir range just above Samarcand and Bokhara to the Sea [of Okhotsk as *Ovis nivicola*, or *Ovis polii*, must be credited with having given to the world this inestimable gift. If it shall really turn out to be true that a true Argali, that is to say a variety of wild sheep, in which both sexes carry horns, had been found in the Taurus, as Ainsworth (cit. A. Wagner, 'Die Geographische Verbreitung der Säugethiere,' Abhandl. d. ii. kl. d. Ak. d. Wiss. München iv. Bd. Abth. i. p. 139), and Ritter ('Erdkunde,' xi. 506), have averred is the case, the claims of the Argali would to some persons, I apprehend, appear to be stronger than they may do if its range should, as I incline to think it will, be shown to be confined to the more easterly limits just given. But under any and all circumstances, the fact that the female Mouflons have no horns, whilst the female Argalis have them, though smaller in size no doubt than those of the male, when coupled with the fact that in the older breeds of domestic sheep both sexes carry horns, appears to me to be conclusive in favour of the Central Asiatic Wild Sheep. As regards the Natural History arguments I shall content myself, and I daresay others also, by referring\* to the already quoted eleventh fascicle of Pallas's 'Spicilegia,' and to Isidore Geoffroy

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\* I may add a few words from the already quoted memoir by Andreas Wagner, l.c., p. 137. "Hochasien ist recht eigentlich das Vaterland der Wildschafe und Wildziege, die hier in zahlreicher Menge und in sehr verschiedenen Formen vorhanden sind. Ob diese alle gesonderte Arten oder nicht vielmehr viele von ihnen nur Rassen von Hauptarten ausmachen, ist eine Frage die noch lange nicht beantwortet est." Mr. Wallace's suggestion ('Geographical Distribution,' vol. i. p. 232), that the vast plateau of Central Asia may, in comparatively recent geological times, have been much less elevated, and may then have been much more fertile than it is now, deserves more than this simple mention.

St. Hilaire's 'Histoire Naturelle,' iii. pp. 86-87, *ibique citata*, but I would add a couple of facts from the linguistic side of the mass of arguments available for deciding the question. The first of these is as follows:—The early Accadian inhabitants of the plains of Babylonia, when they gave an epithet to an animal, very frequently chose it from the locality whence they supposed the animal to have been derived. And the epithet which they bestowed upon the sheep was "num," or "numma,"\* which means "the highlands," and which, as applied by people living in those wide plains, and as being applied by them to the wolf also, has a very obvious significance. It is true, as anybody may convince himself by consulting Bochart's 'Hierozoicon,' ii. 2, p. 516, that poets and other writers, Aryans and Semites, Greeks, Romans, and Arabians indifferently, have connected the sheep, as they saw its habits, with mountainous scenery and surroundings; what is of special importance in the epithet as used in the Accadian column of the bilingual Assyrian inscriptions is, that it was used in such a country and in such early, not to say such unpoetical, times.

My second linguistic fact tells, as it seems to me, strongly in favour of not merely the Asiatic but of the Mongolian origin of the domestic sheep; it appears, I mean, to point to a more or less limited area in the wide field of Asia as having been the particular spot, or at any rate one of the particular spots, where a wild sheep was brought under domestication. This fact as given by Ahlquist in his interesting work, 'Die Kulturwörter der Westfinnischen Sprachen,' 1875, p. 14, is to the effect that the Tatars, by which word he means presumably Turkic and Tungusic tribes, in the neighbourhood of the Lake Baikal, have words of their own for ram and ewe, *täkä*, to wit, and *sarik*, which the Tscheremissians, who live now as far away from that lake as is the river Volga, use as loan words. It is, I submit, not easy to imagine that a word would have maintained its life thus intact and vigorous if the thing which it represents had not been part of the national life of the tribe using and retaining it. And this suggestion gains in force when we learn from the same authority, *i. e.*, that the Hungarian language has adopted Slavonic words for the ewe, the ram, and the lamb, and find him deducing from this the conclusion that the Hungarians, albeit a steppe tribe, had not been shepherds before they came into relation with the Slavs. It may have been due to this, but it may also have been owing to a prepotency either in the

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\* For these facts see the Rev. W. Houghton 'On the Mammalia of the Assyrian Sculptures,' Trans. Soc. Biblical Archaeology, v., 1, 1876, pp. 3-7, *ibid.* 2, 1877, p. 42. 'Gleanings from the Natural History of the Ancients,' 1879, pp. 12-89.

Aryan language or in the pastoral craft of the Slav race. For except upon one or other of these latter hypotheses, it is difficult to see why the Tcheremissians on the Volga should have retained their Mongolian names for the ewe and ram, whilst not only the Hungarians but the Ostjaks, the Vogals, the Mordvins, the Syrians, and the Wotjaks, from the Volga to the Irtisch, should be using more or less modified Slavonian words for the same things. Anyhow, that a lowly, organised language, such as the Tataric, should have words of its own for the domestic ewe and ram, is a point of great significance, especially when we consider that these Tatars lived around the spurs of the Altai range on the lower and middle zones of which the Argali was then, as now, available for the purposes of domestication.

Thirdly, of the horse. The fossil or semifossil bones of the horse, *Equus caballus*, are found in the lower Thames valley gravels under our feet, and from this area of the world's surface all the way to the regions round the Lake Baikal; and in this latter district the horse is found, as I think may be safely said, in a wild state at the present day. It is true that a very large number of naturalists of the first rank, such as Mr. Darwin and Mr. Wallace, have acquiesced in the view which teaches that the so-called "Tarpan" is but a "feral" animal, the offspring of runaway stallions and mares from the steppe droves. But it is also true that the small number of naturalists of the first rank *who have travelled over the Russian steppes*, viz. the younger Gmelin, Pallas, and Middendorff, are of the contrary opinion; and that whilst acknowledging that the steppe horse, like, perhaps, all other domestic animals except the sheep, may lapse into feral habits, they hold to the view that the true "Tarpan" is a descendant of the pristine wild stock, whilst the "Musin" is but a steppe horse run wild.\*

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\* See Middendorff, 'Sibirische Reise,' iv. 2, 2, pp. 1308-1321. Gmelin, 'Reise durch Russland,' i. 45, 1770, and for drawing Tab. ix.

It may be well, for several reasons, to give the exact facts as to the opinions which Pallas held at various times respecting the feral or the truly and aboriginally wild character of the so-called wild horse of the Steppes. In 1769 (see 'Voyages de Pallas,' French translation, 1788, vol. i., p. 324) Pallas inclined to the view of the Tarpan being simply a feral race; and he repeated this opinion in 1773 (see *l. c.*, vol. v. p. 90). But in 1776, in the eleventh fascicle of his 'Spicilegium Zoologicum,' p. 5, he expresses himself to the following effect: "Equi feri in campis Bessarabiciis circaque Tanain et per omnem Tatariam magnam in desertis vagantur gregatim, magnam quidem partem fugitivis Nomadum equis permixti atque multiplicati; ideoque versicolores; atque tamen habitu toto a cicuratis adeo discrepantes ut primitiva de stirpe ferus esse dubitari vix posset. Conf. de iis qui ad Tanain atque in eremo inter Volgam et Jaikum habentur" S. G. Gmelin (the younger Gmelin), 'Reisen durch Russland,' vol. i., p. 44 seq. et Itinerarii nostri, vol. i. p. 211; et vol. iii, part ii., p. 510." See also the posthumously (1831) published 'Zoographia Rosso-Asiatica,' vol. i. p. 260.

To these references I would add the 'Geographische Geschichte,' i. p. 181, 1778,

The main argument for the descent of the wild horses of the steppes from the domestic or semi-domesticated stocks of the Turanian nomads, rests on the fact that a great variety of colour is observed to exist in the free droves. This, however, appears to me to prove nothing more than that the tame and wild varieties breed freely together.\* I myself, long ago, succeeded in maintaining numbers of feral rabbits, parti-coloured with white, on an area already occupied by the ordinary English wild rabbit. The feral rabbits never attained an equality in numbers with the gray stock, but being spared in shooting, whilst the wild stock was not, they maintained themselves for a considerable number of years in what was for themselves as against predatory attacks of various kinds an only too conspicuous prominence. But nobody would have argued from this that no wild stock could be held to exist on that area. Still though we may follow the highly trustworthy naturalists and travellers just mentioned as to the persistence of the aboriginal horse in a wild state on the Turanian steppes, we have yet to show that it is probable that it was on those steppes rather than in any other part of the wide area over which the true wild horse once ranged that it became reduced to domestication. And here again the Accadian inscriptions come to our assistance; the horse being called there (see the Rev. Wm. Houghton, *l. c.* 1876, p. 3), "*imîru Kur-ra*," "the animal from the East." We see from this that these ancient Turanians claimed, and had their claim acknowledged, that the taming of the horse was an achievement wrought out in the cradle of their race. I have sometimes thought that the ascription by the Greeks of this feat to Poseidon may be similarly taken to indicate that they had some sort of dim conviction that the horse had come to them from the countries beyond the Egean. This, however, may be an overstraining of the value of such hints. But the history of the horse, whether dug out of Pile-dwellings and Neolithic interments, or out of records such as those in Genesis and Exodus, show that it came comparatively late into use, as a domestic animal at least, in the regions to the west of the Central Asiatic plains.†

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of the zoologist Zimmermann. Writing only two years after the appearance of Pallas's Memoir just cited, Zimmermann not only entirely accepted the view given above in italics, but *l. c.*, p. 204, speaks in not exaggerated terms of Pallas as "der erste aller von mir gekannten Reisenden."

\* The Mongols and Kalmucks, from superstitious motives, take great pains to secure various colours for their domestic horses, sheep, and goats. Hence some of the variety in the feral horses. See Pallas, 'Mongol. Volk' i. pp. 117, 178, 179.

† See further, Lenormant, 'Premières Civilisations,' tom. i. p. 322; Ahlquist, 'Die Kulturwörter der Westfinnischen Sprachen,' 1878, p. 9; 'Spectator,' April 27, 1878, *ibique a me citata*.

The fourth of the domesticated animals, which I have spoken of as having in great probability had a Central Asiatic origin, the goat, namely, has its claims, supported by the vast majority of naturalists without any hesitation. The wild *Capra aegagrus* of the Taurus, of the Caucasus, of the Persian mountains, and of Kirghiz and Tatar districts, "possibly mingled," says Mr. Darwin, 'Domesticated Animals and Cultivated Plants,' i. p. 105, "with the allied Indian species, *Capra Falconeri*," may be safely taken as the parent-stock of this animal. The Tibetan and Angoran varieties of the goat, by their well-deserved reputation, may seem, even in these days and under the light thrown on the subject by the book just quoted, to lend some support to Col. Hamilton Smith's principle,\* that where the largest and most energetic breeds of a race exist, there we may look for their original habitation.

It is thus seen that four out of the twenty-one domesticated mammalia may, with very considerable probability, be supposed to have been first domesticated in Central Asia, and though the non-cosmopolitanism of the two camels, *Camelus bactrianus* and *Camelus dromedarius*, renders them less available for my present purpose, that, viz., of pointing out the great changes which man has effected in transporting into all parts of the world what he found only in some more or less circumscribed portions of it, the facts of the Central Asiatic origin of the two-humped variety or species, and of the South-western Asiatic, or at least Arabic, origin of the one-humped dromedary, bear not a little on the whole question.

I do not omit the dog and the pig† from the list of the ani-

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\* These are Col. Hamilton Smith's views (Nat. Library, "Dogs," vol. ii., p. 163, *cit. Rev. Wm. Houghton, l. c.*). Speaking of the possible derivation of the greyhound from an Asiatic home "somewhere to the westward of the great Asiatic mountain chains where the easternmost Bactrian and Persian plains commence, and where the steppes of the Seythian nations spread towards the north," Colonel Hamilton Smith says, "when we look to the present proofs of this conclusion and assume that where the largest and most energetic breeds of the race exist, there may we look for their original habitations, we then find, to the east of the Indus, the very large greyhounds of the Deccan, to the west of it the powerful Persian breed, and to the north of the Caspian the great rough greyhound of Tartary and Russia, and thence we may infer that they were carried by the migrating colonies westward across the Hellespont, and by earlier Celtic and later Teutonic tribes along the levels of Northern Germany as far as Britain." It is curious that Colonel H. Smith should not in this connection have mentioned the Thibetan dog, figured by himself, *l. c.*, with the tan-coloured supra-orbital stripe, common so significantly to this variety and to the Mexican Alco. For the Thibetan mastiff has long been known to be one of the largest varieties of the species, and quite recently (see 'Times,' Dec. 26, 1879) Mr. Baber, the consular resident at Szechuen, is reported as writing of them as the largest dogs he had ever seen.

† That the Central Asiatic wild boar lends itself readily to domestication is thus expressed by Pallas, 'Zoographia Rosso-Asiatica,' p. 269. "Porcelli cicurari assuescunt facile et cum domesticis generant." And Radde's words ('Reisen

mals which there is good reason, to my judgment, for thinking were domesticated in Central Asia, because I do not think they were domesticated within that area, but because, I cannot deny, that it is probable they were also domesticated elsewhere. But it may fairly be suggested that the art, skill, and craft of domesticating these and the other six animals having been first learnt in Central Asia, spread thence; and that thus all or nearly all the acquisitions which man has made in the way of domestication, may thus owe their origin, if not in the way of actual blood-lineage, yet in that of being the fruits of man's experience acquired there, to the district in question.

I pass by a natural transition to point out very shortly, not the cardinal necessity of the possession of the sheep, goat, ox, horse, camel, pig, and dog, for food and clothing, for locomotion, and for carrying on the processes of the hunting, of the pastoral and of the agricultural life; but how that necessity has been unconsciously recognised by man in certain of his earliest institutions.

Of these seven mammals, six are now distributed over the face of the whole habitable world; but long before this had become the case with any one of them, except possibly the dog, man had expressed unconsciously, if not quite inarticulately, his recognition of their value by using them in one way or another for one or another of his most sacred rites and ceremonies. The single Latin word *SUOVETURILIA* denoting a particular kind of sacrifice of the swine, the sheep, and the ox, which is figured on many a tablet found in this as in other countries, and was performed at great crises of Rome's fate, may suffice as regards the three animals which speak so plainly to our eyes in those sculptures. To Eastern and to Western people it was indifferent (see Exod. xii. 5, Ps. l. 9, and classical writers *passim*) whether sheep or goats were taken out of the fold for this purpose. As regards the dog, Livy (xl. 6) tells us that in the Purification of a Macedonian army the two halves of a dog's

in Süden von Ost-Sibirien,' 1862, i. 236) are as much or more to the point, as they apply to adult animals: "so muss ich gestehen, dass sie sehr friedlicher Natur sind und es mir mehrmals passirte mittelalte Wildschweine sich mir bis auf vier Faden weite nahen zu sehen." If the so-called "wild" boar is as tame as to allow this so many centuries after the invention of gunpowder, it is easy to understand that it may have been much more amenable to man's influence thousands of years before that discovery. As regards the dog, it seems probable that even within the limits of the Central Asiatic region we are dealing with, two very distinct wild stocks may have furnished corresponding tame ones. The large Indian dog, or Hyrcanian dog of the ancients, may very reasonably be supposed (as suggested by Fitzinger) to have been the parent-stock of the modern Thibetan mastiff, whilst Pallas says that the Kalmuck domestic dog is so like the jackal of the same region that it is impossible not to consider them identical. See 'Spicilegia Zoologica,' Fasc. xi.

body were placed, one on one side, one on the other, of the road along which the soldiers were passed. Similarly, we are told by the Arab Ahmed Ibn-Fozlan, who must have witnessed the proceeding with a good deal of repulsion, that a dog was cut in half and put into the ship in which a Norse chief was burnt in the tenth century on the banks of the Volga (see Anderson, 'Proc. Scot. Soc. Antiq.,' May 13, 1872, p. 522); and I have myself taken up, not without some effort in overcoming a certain reluctance, the bones of a dog who was keeping his mistress faithful company in a grave undoubtedly of the earliest Neolithic period in England.\*

As regards the horse, Achilles, fresh from his conversation with Xanthus and Balius, tells the Trojans (Il. xxi. 132) that even their wonted sacrifices of horses will not profit them; the Mongols (see Howorth's 'History of the Mongols,' i. 262, 289; and Yule's 'Marco Polo,' i. 265, *cit. in loco*), the Lusitanians (Liv. Epit. 49), and the Norsemen (see Ibn Fozlan, *l. c.*), all alike sacrificed horses on great occasions.

I have not found, nor did I expect to find, any account of the sacrificing of the camel, either in Semitic or classical literature; if, however, it be a sound principle that races as yet uncivilised would be likely to sacrifice or otherwise deprive themselves upon great occasions of the services of their oldest and most valued domesticated animals,† we ought to be able to show

\* See 'British Barrows,' p. 518, 1877; 'Journal Anthropological Institute,' October 1875, p. 157.

† As I am speaking of animals domesticated in Central Asia, I have not mentioned the ass which, as Dr. Sclater has shown ('Proc. Zool. Soc.' 1862, p. 164), owns as its parent-stock the *Asinus taniopus* of Abyssinia. Its history gives, however, an illustration of the principles enunciated above at least as striking as those of any of the eight Asiatic mammals just specified. From the references made to this animal in the Pentateuch, it would appear to have been domesticated in the region there treated of before either horse or camel, though subsequently to the ox. Pindar's reference to it as used for sacrifice by the Hyperboreans (Od. Pyth. x. l. 52) will be to persons who will bear in mind its African origin almost as convincing evidence of the great antiquity of the date of its domestication as its appearance on the oldest Egyptian monuments of the Fourth Dynasty. Hecatombs, such as Pindar speaks of, are, numerically, figured on one tomb, reproduced for us by Lepsius. That the ass should so early have been introduced into Hyperborean regions even by a poet is a little surprising, considering that the horse, which is so much better suited for such climates, was already available there; but besides being surprising it is also significant. For the sacrificial and ceremonial use of this animal, see Orelli's 'Excursus ad Tacit. Hist.' v. 3, vol. ii., 1848, of his edition of the great historian, *ibique citata*. Dean Stanley's 'Jewish Church,' i. 96, *ibique citata*. 'Pindar, ed. Dissen and Schneidewin,' sect. ii. 1847, p. 353, *ibique citata*. For the linguistic Palæontology of the name, see Lenormant, 'Origines de Civilisation,' i. 319. For the use of the animal by the modern Hittites, see Lepsius, 'Monatsschrift der Berliner Akademie der Wissenschaften,' 1867, p. 1322, where, however, the ass is mentioned as being used for sacrifice. The difficulty above hinted at remains unexplained.



that the Central Asiatic nomads did so by the "ships of their deserts." And I find in Mr. Howorth's valuable 'History of the Mongols,' i. p. 426, the following passage :—

"Ssanang Setzen now goes on to tell a story which crystallises for us a very curious phase of old Mongol manners. Altan Khakan had a son called Pubet Paidshi. The young man died, and his mother determined to kill 100 boys and 100 foals of camels, which were to be buried with him, and to accompany him as an escort to the other world. She had killed over forty boys when a tumult arose among the people."

Here I think I may leave this part of my subject, the significance of this series of facts being sufficiently self-evident. For as against these seven domesticated mammals which Central Asia may with so much probability claim as being her gifts to mankind, inasmuch as she either herself furnished their parent-stocks, or at any rate furnished the necessary opportunities for gaining the knowledge subsequently used in domesticating similar stocks elsewhere, what can all the rest of the habitable globe set either as regards cosmopolitanism or as regards importance? As regards importance the other thirteen are all but insignificant; as regards cosmopolitanism, universal importation, that is, either for purposes of practical utility or *animi voluptatisque caussa*, as Cæsar put it, we can mention but the African cat and the African ass.

I come now to the consideration of the facts and views with which botanists have supplied us as to the original homes of our cultivated plants. Our own inspection and recollection of the landscapes of the various countries in which we have travelled will enable us to estimate the greatness of the change, which man's migrations and transportations have effected in the sphere of all his labour under the sun. And I will begin what I have to say under this head by the apparent paradox that the argument which our cultivated plants furnish us with for determining the locality whence man issued to occupy the world and subdue it, and alter its external appearance, would, like some other arguments, have appealed with greater force to one of the civilised races of antiquity than it does at first sight to us. It is, herein also like some other arguments, cogent for all that. Let us state it. Fifty per cent. of our cultivated plants have been shown by De Candolle, 'Géographie Botanique,' pp. 986, 987, and by Élisée Reclus, 'The Ocean' (English Trans. ii. chap. 27, 292), following him, to belong to "Europe" and "Asie septentrionale et occidentale," that is to say, to the Palæarctic Region of Zoogeography. So far the figures are equal for cultivated plants and for domestic animals, and I do not feel it necessary

to dwell upon the differences which the other proportional numbers show as regards Africa proper and South America. What is of importance, however, to point out, is that to anybody living, not merely before the time of Columbus, whose discovery has been said to have acted upon the Old World much as the approximation of a new heavenly body, planet, or other, might act upon the whole earth, but before the time, say, of Tacitus and Agricola, what Africa and India had given him in the way of cultivated plants, would have seemed just as insignificant as what, putting the ass and the gallinacean birds out of sight, they had given him in the way of domestic animals. He might, if living in Italy, have said, as did Columella (iii. 9, 5, *cit.* Hehn, p. 423 *l. c.*), "*Curæ mortalium obsequentissima est Italia, quæ pæne totius orbis fruges adhibito studio colonorum ferre didicit,*" and pointed out beforehand the airy inaccuracy of Goldsmith's apostrophe to that country in his 'Traveller.' He might, I am inclined to think, with the evidence available to him, have pointed out, and correctly, that the middle zone of deciduous trees which girdled then, as now, so many of the Italian hills with a belt of chestnuts, and much, therefore, of its distinctive character, was due to the intercourse of Rome with Pontus and Galatia in pre-Christian times. And he might have drawn thence the same conclusions which we may, I think, also draw as to the area on the world's surface whence man set forth westward on his career of occupation, having, as he had, available for his wants, vegetables, plants, and trees of no less value, and of no less prominence in the landscape, than are these of Palæarctic, though not of Italian, origin, viz., wheat, barley, rye, oats, spelt, buckwheat, millet (*Panicum*), peas, beans, hemp, flax, cabbage, turnip, plum, walnut, vine, cherry, olive. Of tea, coffee, sugar, even of rice, of oranges, and of several other of the gifts of the Indian region; or of coffee, or any one of the three, or four if we include *Musa ensete*, now flourishingly growing in Sicily, gifts of Africa proper, a man living at that time had as little knowledge as he could have had of the gifts to come from the still undiscovered New World, of the potato, of maize, of the pineapple, to which his all alien stone pine was to lend its name, of the equally incorrectly named artichoke, of the tomato, now somewhat variously obtrusive or intrusive in Mediterranean regions, or of tobacco, or of the prickly pear, or of the agave, though of the two latter in reference to what was then, and is still, such a large part of human activities, it can be said, as by Admiral Smyth (p. 17 of his 'Memoir of Sicily and its Islands,' 1824), that they "form impenetrable palisades for fortifications, and in the

plains present very serious obstructions to the operations of cavalry."

My third map, with the distribution of the vine after Schouw, should be compared with my picture from Kaempfer's '*Amœnitates Exoticæ*,' Fasc. iv. p. 711, 1712, of what he calls, p. 714, the *Messis dactylifera*, the date-harvest of Persia, and speaks of as being *lulus magis quam labores*. The distributional limits of the "fruitful" vine and the "fruiting" date-palm now, as of yore, overlap each other, as was pointed out by Arago in his '*Mémoire sur l'État Thermométrique du Globe terrestre*' ('*Œuvres*,' v. 216, ed. 1858) in Palestine, when from this fact, he, with much ingenuity, argued that 3300 years have not appreciably altered the climate of Palestine. For "la limite thermométrique en moins de la datte diffère très peu de la limite thermométrique en plus de la vigne;" and, what makes the argument, especially to those who have Kaempfer's picture of the luxuriant date-harvest before their eyes, entirely and beautifully perfect, he further (p. 217, *l. c.*) tells us, "à Abusheer (Bushire) en Perse, dont la température moyenne ne surpasse certainement pas 23°, on ne peut, suivant Niebuhr, cultiver la vigne que dans les fossés ou à l'abri de l'action directe des rayons du soleil." A more simple, but also a more conclusive proof that the Syrian climate has not materially changed within the historic period cannot be imagined.\*

I began this Lecture with details as to the distribution of pines and firs by man's agency; I may fitly close those details by attempting something as regards that of one of the palm tribe. For, though Leopold von Buch was wrong in holding that the two natural orders were altogether mutually exclusive as regards natural geographical distribution, as a voyage in the

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\* It is strange to find that Arago could, when dealing with France, have swerved so far from the line of evidence he employed as to Palestine, as to have told the Chamber of Deputies (February 27, 1836): "Vous serez peut-être étonnés d'entendre que dans les environs de Paris, il y a quelques siècles, il faisait beaucoup plus chaud qu'aujourd'hui," vol. xii. '*Œuvres, Mélanges*,' p. 434. But for the context one might have been tempted to take the last of the words just quoted as applying to the month of February only; and in all gravity the title of chapitre xix. in the memoir already quoted, vol. viii. '*Œuvres*,' vol. v. '*Nat. Scient.*' p. 239, "Observations prouvant que l'ancien climat se maintient dans une partie des Gaules," might seem to justify such an interpretation of words spoken under some provocation in debate. And the more so as a few pages previously (p. 214) we find Arago recognising the essential deceptiveness which must attach to "une foule de documents historiques" in the following words: "On remarquera que je devrai résoudre le problème que je me suis posé sans avoir recours à des chiffres certains, à des observations numériques. L'invention des thermomètres ne remonte guère qu'à l'année 1590; on doit même ajouter qu'avant 1700 ces instruments n'étaient ni exactes ni comparables."

Mediterranean, or the sight of Martius' picture of *Brahea dulcis* (vol. iii. taf. 162) side by side with a true pine in Mexico, teaches us, there can be no doubt that Cæsar and his countrymen were, speaking generally, right in holding the fir and the beech to be as characteristic of Gaul and Britain as their repeated allusions and their coins show them to have thought the palm was of Palestine and the adjacent countries, at least eastward and southward.

What, then, do we know, firstly, as to the original home or botanical region to which the date-palm, *Phoenix dactylifera*, belongs? and secondly, what can we surmise as to the particular spot in that area in which that tree was first made available as a cultivated plant, and subjected to those human influences which three of my pictures are intended to illustrate?

As to the first of these questions there is no doubt, and no occasion for any very lengthy answer. The region which Grisebach names, after its principal constituent element, simply, "Sahara," and which stretches over more than 90 degrees of longitude from Macaronesia to Multania, from the Canaries, that is, to the Great Desert of Rajputana, and which comprehends not only the Sahara strictly so-called, but cis-Saharan Africa also, from the longitude (E. 10°) of Tunis eastward, and not only old Egypt and Arabia, but young "Egypt," or Sinde also, is the botanical region of the date-palm. Sir Joseph Hooker ('Morocco and the Great Atlas,' 1879, p. 409) has pointed out that there are many Canarian plants which form an exceedingly interesting group, the members of which, though chiefly Egypto-Arabian, are found to extend in some instances even into Western India, and he suggests that "it is not unreasonable to suppose that such have covered Africa in a sub-tropical latitude, and thus reached the Canaries under conditions now operating." Other plants, therefore, if not other trees, may have spread over the same area, whether by man's aid or without it, and may be taken as equally characteristic of it, even though they may not need so much "water to their feet and fire to their heads." It is, *per contra*, I may remark, by a surplusage of water to the head and a noxious quantity of heat to the feet, that the latitudinal limits, south and north parallels, of the date-palm are given. If, as Dr. Daubeney suggested ('Lectures on Climate,' 1863, p. 86), we have, as in certain truly tropical (and continental) countries, heavy falls of rain during that particular time of the year when the pollen should be carried to the pistilliferous flower, this latter will not be fertilised (unless by man's interference), the dioecious character

of its flowers putting it thus, as it does also *Borassus flabelli*, at a serious disadvantage as compared with the coconut-palm,\* *Cocos nucifera*, whose company they, in consequence perhaps of a sense of this their inferiority, appear to avoid.

On the other hand, the requirement of a mean temperature of from 70° to 81.5° F. excludes the date-palm from bearing dates, except under specially favourable, and therefore only locally prevalent conditions, eked out by human protection, on the north shores of the Mediterranean;† all the way from Alexandria, where it still grows, to Gibraltar. The solitary, and for this as for other reasons unfertile, palms which we still see here and there in the Ægean and along the region of the west

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\* It is not only the "tempest's wrath," but also the "battle's rage," which the diceous character of the date-palm helps in the work of destruction. The pictures from Lepsius's Egyptian Denkmäler which I have had copied for this Lecture show that this was known in the time of those "great old houses and fights fought long ago." History tells us that Norman and Saracen (see Admiral Smyth's 'Sicily,' p. 19, 'Martius,' iii. p. 262), Anjou and Arabian generals have, each alike, in defiance either of the letter or of the spirit of their professed religion, or of both, cut down the male palms, and so prevented *pro tanto* the reproduction of the tree with 360 uses to mankind. The modern Arabs, according to Rohlf's, 'Afrikanische Reisen,' Aufl. 2, 1869, p. 70, *cit.* Hehn, *l. c.* p. 513, appear sometimes even in very severe military operations or devastations to spare the palm even when cutting down other fruit trees. But Abd-el-Kader appears to have had some transgressions even as to palm-trees on his conscience to repent of. The solitary palm, the existence of which von Baer reports to us on a certain peninsula on the south shore of the Caspian, called in our maps the Peninsula of Mejankal, but in his apparently, and curiously, the Peninsula of Potemkin, is, I should think, a solitary survivor of some such proceedings as those figured in my Egyptian pictures. Von Baer himself looks upon it as a survivor of companions not destroyed by the art and malice of man, but by local refrigeration, due to the extinction of certain volcanoes which were active even in comparatively recent times. *Verecunde dissentio.*

† Martius writes on this subject, *l. c.* iii. p. 263, as follows: "Hæc igitur habuimus quæ de incremento, quod arbor illa capit in imperio floræ per Europam meridionalem patenti, diceremus. Ex quibus intelligi potest omnino ut nascatur arte effici, cogitandumque nobis esse eam plures culturæ gradus intra fines quos occupaverit percurrere. Quæ si ad summum ascenderit flores emittit, fructusque dulcis et boni saporis edit, et si manu et arte accedente fecundetur, etiam semina ad propagandum idonea gignit; quod fit in Hispaniæ parte ad meridiem versus remotissima, in Sicilia, in Græciæ promontoriis maxime ad meridiem vergentibus, et in insula Cypro (nimirum sub lat. bor. 35° et medio calore annuo 18° C. ad 20° C.) In altera zona flores quidem et fructus fert, sed fructuum carlo non plane excolitur, quum acerbi sit saporis, fructificatio nulla, semina cassa: huc pertinet tractus littorum maris Mediterranei in Gallia meridionali, in Italia, in Sardinia, item regionis Dalmatiæ, Insulæ Ioniciæ, Græciæque septentrionalis. Cujus zonæ terminum septentrionalem posueris fortasse 41° 20'–45° lat. bor. In tertia linea palam durat quidem sub divo, sed flores aut raros aut nullos emittit: immo frondescit tantum: ejus zonæ terminus septentrionalis tendit ut commemoravi, per insulas lacus Verbeni sub lat. bor. 46° media anni temperie a 12° usque ad 13° C. Arbor hic provivere potest, etiam si hiemis temperies interdum sub frigoris gradum deprimatur dummodo ne nimis (forsan ad – 3° vel 4° C.) accedat, quo frigoris etiam mali medicæ, citri, aurantii, et myrti extingui atque opprimi solent. Superior altitudinis terminus in monte Aetnæ usque ad pedum 1400 vel 1680, teste viro cl. Philippio, adscendit."

and north shores of Asia Minor, short of the Black Sea eastward, and which still strike us as being something as alien to that landscape as was the seedling-palm at Apollo's Delian temple to the eyes of the much-travelled Ulysses (Odys. vi. 162), have been planted there not as "food-plants," but *animi voluptatisque causa*.

As regards the particular and single spot in the vast botanical region, if particular and single spot there really was, upon the longitudinally vast area upon which the date-palm was brought under that human influence which has since caused it to effloresce into so many varieties, very various opinions have been advanced, and I propose to add a fresh one to their number. It may appear at first sight that such a discussion and such an attempt have in themselves an intrinsic futility. We do not need to refer to King Juba's report of his exploratory voyage to the Canaries to learn that the date-palm will bear dates even in an oceanic and uninhabited island, and some persons may think that we need only, like the wits of Charles's time, to study ourselves and our sensations to see how the forefathers of the Guanches, when they in some post-Juban or post-Augustan period occupied the island, would, under the stimulus of hunger alone, come to learn the art of date-culture, even if they had not brought the knowledge of it with them. Still, I think, on the doctrine of chances, or, what comes to the same thing, the principle, "*Frustra fit per plura quod fieri potest per pauciora*," as well upon certain concrete arguments furnished by the Egyptian monuments on the one hand, and by certain curious but still life-like and truth-like stories on the other, which I find in Herodotus, though other writers have not quoted him *ad hoc*, that it is not unreasonable to suggest yet another site for the one where man first intermeddled with the self-preservation and the species-preservation of the date-palm.\*

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\* It is a little amusing to find twenty-two pages, 289-311, of Seemann's 'Popular History of Palms' devoted to discussing the questions whether the date-palm was an "endemic (genuine) member of the Canarian Flora," and "whether it was indigenous to the Canary Islands." This book was, however, published in 1856, and though something, and perhaps too much, was even then ascribed to "occasional causes" in the explaining of anomalies in geographical distribution, a good deal has been learnt since that which would have rendered that dozen of pages impossible. It is remarkable that the author did not use the arguments supplied him by Dr. Carl Bolle in support of the Atlantic hypothesis, which since those days has been buried as deeply as the Atlantis itself was supposed to have been. Of course another question, not raised indeed by Dr. Seemann, as to whether the art of artificially cultivating the date could have originated in what we now know to be oceanic islands and spread thence eastward is, by the knowledge we have since 1859 gained as to 'Man and Nature' in their independent as well as in their mutually interacting operations, rendered all but an impertinence. We (see Darwin, 'Animals and Plants under Domestication,' i. p. 328, 2nd ed.) "do not

Kaempfer, from whose opinion I dissent with the greatest reluctance when I consider the thoroughness with which that model traveller availed himself of his opportunities, and the abundance of those opportunities themselves, gives us his views as to the place in which the palm in question was first cultivated by man, in the following words (p. 714) of his 'Amœnitates Exoticæ,' Fascic. iv. 3, published in 1714: "Ejus patria in Asia quidem, nam Africam non moramur."

Ritter ('Erdkunde,' Theil xiii. p. 771 *seqq.*) considerably narrows this area by selecting the Babylonian Nabatæans in the valley of the Tigris and Euphrates as having been the people who discovered and first practised the art of improving the date-palm. But Professor Rawlinson, in a letter to me, gives "B.C. 1500, or even earlier" as the possible date of a probably early Babylonian cylinder figured with palms in his 'Ancient Monarchies,' iii. p. 23, 2nd ed., and "B.C. 883" as the earliest date for Assyrian figures representing palms; whilst the Egyptian Twelfth Dynasty, which possessed the tree, carries us back to from 1860 B.C. to 2200 B.C., according to Wilkinson and Brugsch respectively.

Unger, 'Sitzungsberichte k. Akad. Wiss. Wien,' Bd. xxiii. Hft. i. p. 204, 1857, suggested the countries on the eastern side of the Persian Gulf as the centre whence in the very earliest times of commerce and international intercourse this plant was carried over Arabia, Persia, Hindustan, and North Africa. But he, in a later Memoir, published after travel in Egypt, *ibid.* xxxviii. pp. 75, 104-106, 1859, quotes Delile as averring that, *valeat quantum valeat*, the Egyptians themselves considered that Arabia Felix was the original country of the date-palm; and by twice (*ll. cc.*) mentioning the fact that Egypt itself is called not only the land of the sycamore, but also the land of the palm-tree, he would appear to assign the same weight to that tradition which I have felt justified in assigning to those embodied in the Accadian Inscriptions. Unger himself suggests, though very guardedly, that the date may have been imported into Lower from Upper Egypt. He is, as such a botanist would be sure to be, careful to disclaim any acceptance of the cogency which others have assigned to an argument based on the luxuriance of growth which the tree does attain in the locality in question. "There is nothing in all this, however,

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believe that any edible or valuable plant except the Canary grass has been derived from an oceanic or uninhabited island." It is only just *not* an impossibility that the date-palm should have been so derived; if it had been, this would indeed have been something more surprising than all the usefulness of the tree, than all its beauty, and even than all the blunders which have been made about it.

to hinder us from supposing that the palm does so flourish there, because in its migration from the north southwards it came in the latter place for the first time upon the soil best suited to it."

Martius, on the other hand (*l. c.* iii. 263), uses this very argument for assigning the original site of the date-palm to the southern part of Tunis, "Blad el-Dscherid," as he writes the name of the locality, *h. e. arida terra*, "falso nuncupata Biledulgerid," as he adds, "Beled el-Jerid," I may add as named in Johnston's Royal Atlas in lat. N. 34°, long. S. 10°. "Quo loco," says Martius,\* "solidæ conspiciuntur palmarum sylvæ tanquam in prima patria gnatæ. Earum fructus sunt frequentissimi et sapidissimi."

Professor Robert Hartmann ('Die Nigritier,' pp. 116, 117, 1876) gives the most recent account with which I am acquainted of the date-palm as cultivated in Africa. His remarks as to the existence in Africa of really wild forms of *Phoenix*, e.g. *Phoenix spinosa s. humilis*, the "Kjom-kom" of Senegal, with small well-flavoured fruits, and the *Phoenix reclinata*, a very variable form, to set off against the *Phoenix sylvestris indica* which has so often, though not correctly, been said to

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\* In the same African connection in Martius's grand book I find the two following passages, which are in themselves a lecture on the extent to which man has modified the landscape of Southern and Northern Africa, both by acclimatising there plants, some useful merely, some beautiful, some both, from "regions Cæsar never knew," China, namely, and America. The maize might have been added to the importations specified in those quotations. Speaking of the date-palm Martius says (p. 264): "In Promontorium Bonæ Spei introducta, nunc per calidiorum regionum hortos sparsa et una cum *Solano tuberoso*, *Triticæ rep. colitur*." Speaking of the North Coast and the *planities Tadschuræ*, he writes: "Palma illic est splendidissimum decus sylvarum *Citri aurantium quæ Opuntias cinguntur*." The potato, the orange, and the hedges of *Opuntias* set round them were as little known to "all the world" of the Mediterranean as the gas, the coal, the glaze of our pottery, and the tea, coffee, and tobacco, which, though sold by the *épiciers* in every English hamlet, and making up, as some persons will say, but a Philistine tale, are yet become absolute necessities of life even to the most cultured of mankind. [Since writing as above I have met with an Address delivered September 24, 1879, by the traveller Nachtigal before the German Association for the Advancement of Science at Baden-Baden. In this Address, delivered in deprecation of certain schemes for the utilisation of certain parts of the Sahara, Herr Nachtigal insists that whatever other results might accrue from the letting in of the waters of the Mediterranean upon the salt marshes of the district referred to by Martius, as cited in the text above, the ruin of the date-culture, the most valuable treasure of that region, would probably be one also. For "the date-palm," says Herr Nachtigal, "wants fresh water for its roots, solar rays for its crown, and fears rain and atmospheric moisture. It is well known that date-plantations in the neighbourhood of the sea produce only second-rate fruit; and there is some ground for doubting whether the regions exposed to the doubtful benefits of the Mediterranean are really the regions which produce the best dates in the world and thereby have earned the name Beled el-Dscherid, that is, literally, the Land of the Date-palm. Would it not be rash to endanger a cultivation, the produce of which is counted by millions of money, for very uncertain results?"]



be botanically indistinguishable from the cultivated *Phoenix dactylifera*, are specially valuable. He insists, as I had also done, previously to becoming acquainted with his views, upon the priority of date, which the Egyptian monuments, with date-palms figured upon them, can show us compared with the Assyrian or Babylonian similarly adorned. The only argument which I can imagine, I have not seen or read of its being suggested by any one else, to be likely to be set against this one based upon the monuments, is one, partly, indeed, based upon ancient Egyptian records, but partly also upon stories recorded for us, with every indication of their being true, by Herodotus. It might run thus. Brugsch (*cit. Unger, l. c.* 1839, p. 106. *Geographie der alter Egypten*, p. 74) tells us that palm-wine is enumerated in the Egyptian Tribute-lists as having been one of the articles received from Babylonia. Herodotus, i. 193, informs us that wine was made from dates in Babylonia; and in a couple of passages, iii. 20, 22, he relates what has become, since his time, the very commonplace occurrence of a superiorly civilised assailing an inferiorly civilised race by means of strong drink. He tells us how Cambyses sent a cask of palm-wine, presumably brought with him from his own country, as a present to the Æthiopians, previously called "blameless" by Homer. The Egyptians, also, according to Herodotus, ii. 86, employed palm-wine (probably, when we compare this passage with the others already cited, from Babylonia) in the process of embalming. I have set up this argument, but I think I may knock it down, and thereby save some of my friends some trouble, by observing that in England we ought not to think that because a country shows pre-eminent skill in manufacturing raw material, that therefore that raw material must even have been grown, not to say, originally found growing wild, in that country. Fusel oil, for example, a product analogous in its operation to palm-wine, is manufactured in this land out of potatoes; but potatoes are not thereby shown to have been first cultivated either in Great Britain or Ireland.

I gather from Martius that "Celsius in Hierobotanico operam dat ut Palæstina tanquam veram hujus arboris patriam esse ostendat."

I, in my turn, venture to advocate the claims of the Nasamones who dwelt around the south-eastern extremity of the *Syrtis major*, now known as the Gulf of Sidra (long. E. 20°), to be considered as the race which first cultivated the palm; and with them I should couple those of the Garamantes of Fezzan. What I have to say about them is based mainly upon the apparently truthful and certainly singularly life-like account

which Herodotus gives of them in three or four passages, i. 32, and iv. 172, 182, 183, none of which Martius refers to in his enumeration of profane writers in contradistinction to the sacred writers who mention date-palms referred to by Celsius; but partly also upon a single passage of Diodorus Siculus, iii. 4. We find thus that the Nasamones were a numerous and powerful, but certainly a very far from civilised people. They combined polygamy with polyandry, much as the Massagetæ did at the same time. Some of their other practices combine several of the notes of a priscan people, such as the veneration of ancestors, and the regard for justice which has made the words *Trollorum fides* proverbial; and finally those social feelings which are indicated by the words, i. 32, ἀνδρῶν δυναστῶν παῖδας ὑβριστάς, and which Nillson\* has averred to be eminently characteristic of savages. I subjoin the entire passage, iv. 172,† for several reasons, in the original Greek; and I submit that a people who embodied so much of wild life in their social condition, could have learnt little from any of the nations to the east of them, whether Egyptian, Arabian, Assyrian, or Persian. But as regards their dealing with the date-palms, we have this remarkable statement made by Herodotus, iv. 172 and 182: "In the summer they leave their flocks by the sea-side, and go up to the district, Augila, to get in the harvest of the date-palms, which grow there in great abundance, and are of great size, all being fruit-bearing." Now Herodotus, and, as he tells us, i. 193, the Greeks of his

\* 'Early Inhabitants of Scandinavia,' Eng. Trans. ed. Lubbock, p. 167, "Aristocracy is strongly developed amongst all savage nations."

† As regards the size of the Fezzan dates, the dates of the Garamantes referred to by Herodotus, iv. 183, as living ten days' journey from Augila westwards, and as having φοίνικες καρποφόροι πολλοὶ κατὰ πῆρ καὶ ἐν τοῖσι ἐτέροισι, we have the following information from Dr. Ed. Vogel, *cit.* Seemann, *l. c.* pp. 285, 286: "The largest date of Fezzan (which is also the best) is 21½ Parisian lines and 10 in diameter, the smallest 7½ by 5." Lyon, in his 'Narrative of Travels in North Africa,' 1821, p. 72, tells us, "the dates of Sockan in Fezzan are of a quality far superior to any produced in the north of Africa." Herodotus, iv. 172: Αἰσχισίων δὲ τοῦτων τὸ πρὸς ἐσπέρας ἔχονται Νασαμώνες, ἔθνος ἐὼν πολλόν· οἱ τὸ θέρος καταλείπυντες ἐπὶ τῇ θαλάσῃ τὰ πρόβατα, ἀναβαλόνσι ἐς Αὐγίλα χώραν, ὁπωριεύντες τοὺς φοίνικας· οἱ δὲ πολλοὶ καὶ ἀμφιλαφεῖς πεφύκασι, πάντες ἐόντες καρποφόροι· τοὺς δὲ ἀτελέβους ἐπεὰν θηρεύσωσι, αἰήναντες πρὸς τὸν ἥλιον καταλείουσι, καὶ ἔπειτα ἐπὶ γάλα ἐπιπάσσοντες πίνουσι. γυναῖκες δὲ νομίζοντες πολλὰς ἔχειν ἕκαστος ἐπικούον αὐτῶν ποιεῦνται τὴν μῆζιν· πρῶπν παρατλησὶ τῷ καὶ Μασσαγέται, ἐπεὰν σκίπωνα προστήσωνται μίσγονται. πρῶτον δὲ γαμέοντες Νασαμώνες ἀνδρὸς νόμος ἐστὶ τὴν νύμφην νυκτὶ τῇ πρώτῃ διὰ πάντων διεξελθεῖν τῶν δαυτομόνων μισγομένην· τῶν δ' ὥς ἕκαστός οἱ μιχθῇ· διδοὶ δῶρον τὸν ἄνδρα φερόμενος ἐξ οἴκου. Ὀρκίοισι δὲ καὶ μαντικῇ χρέωνται τοιγῇ. Ὀμνύουσι μὲν τοὺς παρὰ σφίσιν ἄνδρας δικαιοτάτους καὶ ἀρίστους λεγόμενους γενέσθαι, τούτους, τῶν τύμβων ἀπτόμενοι. Μαντεύονται δὲ ἐπὶ τῶν προγόνων φοιτούντες τὰ σήματα, καὶ κατευζόμενοι ἐπικατακοιμῶνται. τὸ δ' ἂν ἴδῃ ἐν τῇ ὄψει ἐνύπνιον, τούτῳ χρῆται. Πίστισι δὲ τοιγσίδε χρέωνται· ἐκ τῆς χειρὸς διδοὶ πιεῖν, καὶ αὐτὸς ἐκ τῆς τοῦ ἐτέρου πίνει· ἢν δὲ μὴ ἔχῃσι ὑγρὸν μηδὲν, οἱ δὲ τῆς χαμάθεν σποδοῦ λαβόντες λείχουσι.

time generally, were acquainted with the bisexual dioecious character of the palm and the fig; that the Babylonians used artificial means for securing the impregnation of the pistilliferous trees he tells us *in loco*; and we know that those latter were, as they are (see 'Kaempfer,' *l. c.* p. 672) still, to be found in Persia and as they are (see 'Martius,' *l. c.* p. 261) still in Egypt. Some considerable weight, therefore, may fairly be assigned to his statement, iv. 172, to the effect that at Augila (as also probably, see iv. 183, in the country of the Garamantes) there were none but these latter pistilliferous trees. Of course this statement would need supplementation by one which he may very well have supposed his readers would take for granted, to the effect that the Nasamones (and probably the Garamantes) brought the male flowers from a distance, carefully selecting those *liberaliori quodam vigore ac pleniori habitu*, just as Kaempfer, p. 672, tells us the Persian date-farmers did; this being, in fact, the whole pretty nearly of what is required in the way of cultivating the date-palm. The palms resorted to, at least by the Nasamones, were large; they could not, therefore, have been wild date-palms; and being thus proved to be more or less under the care of man, they are, secondly, proved to have been even more under that care and more dependent upon it than cultivated palms elsewhere, inasmuch as the pollen necessary for fertilising their flowers had to be brought to them from a distance, the bridging over of which could only be effected by man's intervention at fixed intervals. My argument, in other words, lies in the fact that a tribe, which, being of very priscan habits and customs, cannot be supposed to have borrowed much from its more civilised neighbours, was, nevertheless, credited in the time of Herodotus with possessing groves of cultivated and exclusively female date-palms, which bore large and, we may, perhaps, infer, excellent dates, as they still continue to do.

We have furnished to us in modern times a verifiable history very closely parallel with that which I here suggest; the *Elæis guineensis* is undoubtedly, as a cultivated plant, an acquisition of negro minds; and as Hartmann says, *l. c.* p. 118, this acquisition has been made for us by a race which still carries on the practice of human sacrifices; and that in sight of European factories and European steamboats, much as the Nasamones, whom I suppose to have discovered the cultivation of another palm, carried on their polyandry almost within sight of the Egyptian pyramids. "The thing that hath been is the thing that shall be."

The picture before you from Kaempfer's '*Amœnitates Exoticæ*,'

p. 711, Tab. iii., Fasc. iv. 1711, coupled with his comment\* upon the scene of enjoyment which it represents, and in which the palm-trees play so essential a part, may remind us of Linnæus's often-quoted saying, "Man *dwells naturally* within the tropics, and lives on the fruit of the palm-tree; he *exists* in other parts of the world, and there makes shift to feed on corn and flesh." But it may suggest a little more than this. It may cause us to think seriously on the question what will be, not the effect on external nature which man's action will produce, but what will be the effect which external nature will produce upon man, if by some recrudescence of a glacial period, either in a geological sense, or in the economic sense, which an exhaustion of our supply of Nearctic as well as Palearctic coal would, in the absence of any substitute, bring about, we should be driven southwards, and become tropico- instead of cosmopolitan. What will be the effect of the easy terms upon which life can be maintained in the tropics upon the species which has hitherto never developed a lasting civilisation except under the stimulation "*curis acuens mortalia corda*" of northern latitudes or mountain elevation?† How will it fare with intellectual culture when and where, not to speak any further of our date-palm, the coconut-palm, the banana, the breadfruit, will make exertion so all but superfluous for the *dura a stirpe genera* who now govern the world? If we are to guide ourselves as we peer into the twilight of the future by what we can see going on in the broad Mediterranean noonday of the present, the example of the idle Corsican is not altogether encouraging. A Corsican family, we are told by their French fellow-citizens,‡ with a couple of dozen of chestnut-trees, and with a herd of goats which "find themselves," to the great disgust of all botanists, have no aspirations left to satisfy beyond that of being able to buy a gun, to the great disgust of all sportsmen. In a matter of prophesying, Sir, the argument from authority and authorities has its legitimate place, and upon the present occasion it happens to have a very legitimate time. I have in a work on 'Hereditary Genius,' published in the year 1869, found it stated that "No Englishman of the nineteenth century is purely

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\* "Hi sunt palmicolarum in messe, ut sic loquar dactylifera lusus magis quam labores, neutiquam cum nostratium agricolarum infinitis occupationibus comparandi. Heu ilias hic laborum! dum agros effringimus subaramus et resultamus; dum occamus et liramus, runcamus et refarrimus. . . . Secus sentias de ambrosiis dapibus Persarum et Arabum; hæ gratis omnino et solo almæ naturæ munere conferuntur."

† Wallace, 'Natural Selection,' p. 318; and Bonstetten, 'L'homme du Midi et l'homme du Nord,' 1826, *passim*.

‡ Hehn, *l. c.* p. 346.

nomadic:" and that even the most so among them have also inherited many civilised cravings which are necessarily starved, and thus entail personal discomfort and create the required stimulus for their gratification, when they are tempted to let themselves lapse into savage Corsican sloth. In the thousands of years which may yet intervene between us and the necessity for a southward exodus, these cravings and uneasinesses will have become more inseparably a part of our nature than even the most optimistically-minded member of the London School Board can as yet assert they have become. I have not far to look for another authority who will assure us that the desire and appetite for intellectual enjoyment may become as really a "constitutional demand" as those lower stimuli which in "old, unhappy, far-off times" enabled man to subdue other gregarious animals to his own uses, and, so aided, to overrun victoriously the whole globe. Your Secretary, Mr. Bates, after eleven years of absence from England, to which the world owes his charming work the '*Naturalist on the River Amazon*,' and after seeing many tribes living in the happy position in which a moderate amount of light work will produce for the simple, peaceful, and friendly people all the necessities of their simple life (*l. c.*, vol. ii. p. 137 of the *Mundurucus*), found yet (p. 416) "after three years of renewed experience of England, how incomparably superior is civilised life, where feelings, tastes, and intellect, find abundant nourishment, to the spiritual sterility of half-savage existence, even if it were passed in the garden of Eden. What has struck me," says Mr. Bates, "powerfully is the immeasurably greater diversity and interest of human character and social conditions in a single civilised nation, than in equatorial South America, where three distinct races of man live together. The superiority of the bleak north to tropical regions, however, is only in their social aspect, for I hold to the opinion that although humanity can reach an advanced state of culture only by battling with the inclemencies of nature in high latitudes, it is under the equator alone that the perfect race of the future will attain to complete fruition of man's beautiful heritage, the earth." \*

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\* V. Baer, who after making himself in his earlier years a prince among biologists, became in his later years a not inconsiderable geographer, expressed himself in Russian so long ago as 1848 in one of the geographical manuals of the Geographical Society of Russia to much the same effect as the two writers above quoted. His words were translated into German no earlier than 1873, and stand as follows in his '*Studien aus dem Gebiete der Naturwissenschaften*,' Theil ii., Hälfte i. p. 45-46:

"Mit recht prophetisch daher aus dieser Productions-Kraft der Tropenwelt ein geistreicher Botaniker, Herr Meier in Königsberg, dass der Mensch, in der

It is something like an anticlimax to suggest that even when man is in the tropics and surrounded there with all the luscious temptations which the cultivation of those latitudes will give him on such easy terms, he will still be beset with certain urgent needs in the way of supplying his bodily wants as well as his cravings for intellectual excitement and employments. For it is a mistake to think that the craving for flesh and even for fatty foods becomes at all obsolete in tropical countries, or that man is at all less of a flesh-feeder in the regions which are now at least the selected localities of the most typical flesh-feeders, from Carnivora in his own class—through the vertebrate

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civilisirten Welt rasch sich mehrend, in die heisse Zone zurückwandern werde. Jamaica allein, so gross ungefähr als das Königreich Sachsen, werde vielleicht 25, ganz gewiss aber 12½ Mal so viel Menschen ernähren können als Sachsen. Und wie viele, setzen wir hinzu, die Walddfläche Brasiliens! Verkehrt genug nennt man diesen Boden einen jungfräulichen. Er trug nur für den Menschen bisher wenig Frucht. Dagegen hat der Haushalt der Natur Jahrtausende hindurch in ihm organischen Stoff aufgespeichert für die Menschen, die noch kommen sollen, sowie in andern Gegenden früher, als die Erdrinde sich bildete, in ihr Steinkohlen vergraben wurden als ungeheure Magazine von Brennstoff für eine Zeit, in welcher das vermehrte Menschengeschlecht den Waldwuchs sehr beschränkt haben wird. Aber der Mensch, der aus Europa zurückwandert in die Heimath, aus der er ursprünglich ausgewandert ist, bringt einen Gewinn mit, den er unter den Tropen nirgends erlangt hat, *die Liebe zur Arbeit, die Schätze der Wissenschaft, die Künste der Industrie und die Einsicht in die Bedürfnisse eines geordneten Staatslebens*. Damit könnte er freilich die arbeitscheuen Naturzustände der früher dort ansässigen Völker erdrücken. Aber man darf hoffen, dass unter dessen auch die humane Gesinnung immer mehr sich fest gesetzt haben wird, dass der weiter vorgeschrittene Mensch erkennt, dass er kein Recht hat, den unentwickelten jüngern Bruder zu unterdrücken, sondern die Verpflichtung, ihn schonend weiter zu bilden; dass die Erde ein grosses Waisenhaus ist in welchem die sogenannten Wilden die zahlreichen Waisen sind. Man darf erwarten, dass unter den Tropen, wo weniger Zeit für die Production der Nahrungsmittel erfordert wird, wo die Natur sie an Bäumen reifen lässt, die geistige Bildung viel allgemeinen werden muss als im Norden. In der That hat doch in Mittel-Europa, ich spreche nicht einmal von unserem Norden, nur der kleinste Theil der Bewohner Musse genug, um die geistigen Anlagen, die in ihm schlummern, auszubilden, während die bei weitem grössere Anzahl das ganze Jahr hindurch beschäftigt ist, den Nahrungsstoff zu bereiten. Wie viel mehr Musse hat schon die arbeitende Klasse in Italien! Auch hat sie nicht aufgeführt, an Kunst und Wissenschaft sich zu ergötzen, und wird dafür von uns Nordländern mit Unrecht, wie ich glaube, träge genannt. *Europa scheint mir also für die Geschichte der Menschheit, wenn wir sie in grossen Umrissen überblicken, die hohe Schule, wo sie zur Arbeit gezeugen wurde und geistige Beschäftigung lieben lernte*. Möchten unsre Nachkommen der 30sten und 300sten Generation, wenn sie im üppigen Ceylon oder in der ewig gleichmässigen Temperatur der Südsee-Inseln im Schatten der Palmen über die Schicksale der Menschheit nachdenken, anerkennen, dass wir die Schulzeit im Norden nicht schlecht verwendeten, sondern geistige Gaben auf sie vererbt haben, die unter den Tropen nicht gedeihen konnten, denn noch jetzt lebt der Naturmensch dort in sorgenloser Kindheit. Möchten sie, wenn sie wissenschaftliche Reisen in den Norden unternehmen um den Schnee mit eigenen Augen zu erblicken, mit dankbarer Achtung auf die Ruinen unserer Schul- und Arbeitshäuser sehen."

Mr. Herbert Spencer speaks to the same effect in his 'Principles of Biology, vol. ii., pp. 502-3.

snakes down to Arachnida in the Invertebrata—than he is in the picturesque wilds where the flesh-furnishing Cheviot sheep are so abundantly forthcoming as to enter even into the landscape. It were a still greater and more serious mistake if any one were to compare, for succulence or sapidity, the flesh-food as yet procurable in the tropics with that which we have furnished us in every well-ordered house, and even hostel, in the United Kingdom of the chilly and rainy isles.

The subject is not altogether romantic, as I have already acknowledged; there is the more reason therefore for putting its practical side prominently forward, and thereby, as we may hope, doing something, however humble, for the bettering of man's estate. That it is not altogether visionary to hope for some improvement in this direction, or to strive to make acquisitions in the way of domestication under a tropical of the same kind as those which our forefathers made under a Central Asiatic sun, the following utterance of the late Dr. J. E. Gray, of the British Museum, an authority untainted with enthusiasm, may be taken as showing. Speaking at the 1864 (Bath) Meeting of the British Association (see Report of Address, p. 83, in Transactions of Sections), of our at present available domestic animals, Dr. Gray said: "An attentive study of the list, and of the peculiarities of the animals composing it, induces me to believe that, in attempting to introduce new domestic animals into some of our colonies, it would be desirable not to confine ourselves to the European breeds, but to ascertain whether some of the domestic races of Asia or Africa might not be better adapted to the climate and other conditions of the colony, although for reasons, to which I have before adverted, it would neither be worth the trouble, nor consistent with good policy, to attempt their introduction here.

"There is evidently ample room for such experiments, which might be advantageously made, for instance, in the colonies of the coast of Africa, where our horse, ass, oxen, sheep, and goats, and even dogs, have greatly degenerated, where the horse and the ass live only for a brief period, where the flesh of the ox and sheep is described as bad and rare, and the flesh of the goat, which is more common, is said to be tasteless and stringy. The pig alone, of all our domestic animals, seems to bear the change with equanimity: and the produce of the 'milch pig' is often sold to passengers of the mail packets, and the ships on the stations, as the milk of the cow, or even the goat, is rarely to be obtained. Unfortunately both the white and the black inhabitants are merely sojourners in the land, and do not

seem to possess sufficient energy or inclination to make the experiment themselves."

There is a more serious aspect or rather prospect of our future relation to the animal world. In this realm of activity, as in some others, we have of late been very rapidly extending our responsibilities. A man needs not to have spent years in the Malay Archipelago as Mr. Wallace has done, nor in the very different surroundings of Siberia as Middendorff has done; nor, Sir, in those of South Africa, to be convinced that the numbers of domesticated animals, I do not say of species of domesticated animals, will assuredly, and at no such very distant period, gain a relative magnitude of which our forefathers, who so patiently won them for us from savagery, could have had no conception. And that earlier than the attainment of this relative preponderance, the domestic animals on this world's surface will be nearly the only large land animals left upon it, and that the wild ones will be but pigmy vermin, "*winzige Ungeziefer*," in Middendorff's words, or, at least, less noble animals, is equally evident. For example, we can see as regards the lion, the king of beasts, that the breech-loading rifle is now rapidly completing what the smooth-bore, with flint and steel, began; for whereas he loses his life by his boldness in coming out into the open, we have in one part of the old world the tiger, and in another the hyæna, substituted for him, a change in neither case much or at all for the better.

I have no reason for doubting that in these days we all consciously strive to act up to what has been spoken of, though not wholly correctly, as "the new commandment of the nineteenth century," "Thou shalt not be cruel;" and I sincerely trust that as regards all animals, domestic and wild, whether in the fields or in the streets and shambles, whether in the woods or within walls, this commandment may, like some others, attain greater extension in practice, as its many-sided applicability becomes more and more manifest. But I think that, even without our intending it, the extension of domestication has increased the sum total of lower animal happiness. A South African traveller, Sir, whose authority you will not repudiate, and we shall not even question, has told us (Galton, 'Domestication of Animals,' Trans. Ethno. Soc. iii. N.S. 1865. p. 122), from his own observation of the still very really wild life of those regions, that it is not after all such unmixed happiness as persons might think, who have never crouched by night by the side of pools in that thirsty land, and watched how nightly drinking, even of water, may lead to much misery. "The life of all beasts," says that



writer, "in their wild state, is an exceedingly anxious one. From my own recollection, I believe that every antelope in South Africa has to run for its life every one or two days upon an average, and that he starts or gallops under the influence of a false alarm many times in the day." Surely whatever the biped, who can foresee and ponderate, may think of the lot, and the future of the domestic Ruminants, their lot, to themselves, as they are not troubled with anticipations, totals up an aggregate of comfort and even of enjoyment far exceeding that which the majority of wild graminivorous creatures of similar bulk ever obtain. A flock of well-fed Cheviots, on a snowy moor, in all their hornlessness and helplessness as against violence, shows the traveller that he is in a country whence wolves have entirely disappeared; would their lot be happier if they were exposed not merely to the winds and sleets of Northumbria, but also to the attacks of wolves to which even in France and Germany they would be liable?

We need not, however, travel in South Africa, as you have done, to prove the point that dog-fights and bull-fights, cockpits and shambles notwithstanding, domestication has, on the whole, increased the sum of the happiness of the lower animals. Let us by an easy effort of imagination figure to ourselves what would become of the flocks and herds of sheep and oxen, "even very much cattle," which are now living with as large a share of enjoyments as, and a very much larger share of leisure at least than many of their masters, if those masters were one and all to be swept away by some epidemic. Suppose, as Dr. Roberts in his memoir on 'Spontaneous Generation' (p. 39) has suggested, that the ferment which produces some one or other of our worse forms of infectious disease should "sport," as it is playfully styled, or vary, as a peach may sport or vary into a nectarine; and then suppose that the increased malignity and infectiousness with which it might thus become endowed, should as entirely destroy our own species within these Islands, as of late years disease has been known to entirely depopulate certain Polynesian islets, or as some analogously-developed disease may be supposed to have exterminated the horse in South America within recent geological periods. There can be very little doubt in the mind of anybody who has much experience of the power of combination for mischief which dogs can, independently of men, develope, even in a civilised and thickly populated country, that in a few days after our disappearance they would be masters of the country. The mere desire for blood which is so eminently characteristic of the musteline carnivores would very shortly and certainly show itself again in our old servants

in their Saturnalia; and in a very short time the entire race of sheep, except in a few mountain districts, would have been as wastefully slaughtered for their blood and fat as flocks and herds have been and still are slaughtered by us in Australia or South America. Oxen would hold out a little longer than sheep, and pigs, I incline to think, longer than either. But that a great diminution of the sum total of brute enjoyment, and, if such a thing there be, of brute happiness also, would take place after we had disappeared, I think needs no demonstration, especially to anybody who, without any experience of any canine mutiny, has ever studied the phenomena of a dog-show or listened at night to the opera which its denizens perform. The various races which, without exactly being domesticated, stand yet on the borderland separating wild from domesticated life, would also very shortly and very sharply have brought home to them the fact of their being more dependent on man than perhaps either they or we have entirely recognised. Rabbits and hares, pheasants and partridges, if they had reason, would reasonably regret the times when they viewed, with something perhaps of disgust, the slouching form of the gamekeeper with his double-barrelled shot-gun perambulating the ridings in the woods and skirting their sunny boundaries. Cats and weasels would with little less delay than the dogs make the life of quadrupeds just specified as miserable as that of the sheep and ox had already been made; and would, after the lapse of a year or two, with the aid of hawks and corvidæ of several kinds, greatly thin their numbers. The river embankments on the lower Thames, lastly, which excited the admiration of Sir Christopher Wren, and were referred by him to the time of the Romans, and also those on many other rivers, having no one to repair any of the breaches which floods would make in them, would before very long allow a very large acreage of land to become swamp, marsh, and lagune; not only thus, on the one hand, depriving many species of animals of their means of subsistence, but also on the other introducing predatory birds, such as gulls, and accelerating the disappearance of many others which really hold their own in such neighbourhoods even now only by man's protection and thanks to his presence.

The purview of this prophecy extends no further than the precincts of the British Islands; in continental countries organic nature would more completely resort to the condition it was in before it began to be modified by man's interference; the *Regnum Hominis* would not be succeeded by the *Regnum Canum familiarium*, but by that of *Canum luporum*; and generally the larger *feræ naturæ*, both those which eat others and those

which are eaten by others, would resume an importance even in the landscape which their extirpation within our four seas has rendered an impossibility for all future time short of the time when the Channel will once again become dry land.

In concluding a Lecture the title of which might serve for the often-to-be-repeated title of many successive and closely printed volumes, let me take as a text the following words from Victor Hehn's book, '*Kulturpflanzen und Haustiere*,' 3rd edition, 1877; Berlin; p. 435), to which I owe more even than I have expressed: "Was die Moderne Welt von der alten unterscheidet ist Naturwissenschaft, Technik und Naturalökonomie;" what makes the modern world to differ from the old is natural science, command of apparatus, and political economy. As regards this last differential peculiarity, I have to remark that Herr Victor Hehn's last edition bears the date of 1877, and that, consequently, he cannot have had colonial tariffs either of Melbourne or of Canada before his eyes; nor, though living in Berlin, could he have heard the words uttered there only ten days ago, though they were in an authoritative voice (see '*Times*,' May 2nd); nor, finally, could he have been present at a meeting attended in Paris by the representatives of no less than fifty-eight Chambers of Commerce on the very day before, the first, that is, not of April, but of May in this very year of grace 1879. Otherwise I cannot but think that Herr Hehn would not have said the political economy of the present, either as put out in words, or as carried out in practice, was so very different from that of ancient times. To any one at all thick of sight or hard of hearing the proportions of any such difference are wholly inappreciable. I turned to what was one of the favourite studies of my youth, my Aristophanes, and I find Dicæopolis, to adapting whose name Prince Bismarck would, I apprehend, as little object as it would seem he does: to his adopting his principles, sighing (in the *Acharnians*, l. 33-36) for the time when he would get back to his farm\* the articles consumed in which at least were "reserved for native industry."

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\* Aristoph. *Acharn.* 33-36.

τὸν δ' ἐμὸν δῆμον ποθῶν  
ὅς οὐδεὶς ὅπου' εἶπεν ἄνθρωπος πρῶτα,  
ἀλλ' αὐτὸς ἔφερε πάντα χὼ πρῶτον ἑπῆν.

Cato and Varro appear, according to the passages given in Hehn, p. 425, to have been similarly in the dark, the first of these averring, 2, 5, in words very nearly reproducing that of Dicæopolis, "*Patrem familias vendacem non emacem esse oportet*," whilst the latter, 1, 22, 1, in words which the Chambers of Commerce aforesaid re-echoed in their modified Roman tongue, "*Quæ nasci in fundo ac fieri a domesticis poterunt, eorum ne quid ematur*."

The amount of difference between those views and those of the statesman just mentioned, or those of M. Pouyer-Quertier, or of another countryman of MM. Quesnay, Turgot, and Chevalier who is reported in the same 'Times' of Friday, May 2nd, no time having been lost in giving these valuable views to the world, to have averred that an increase in the imports denoted the impoverishment of a country; I must, as did Captain Lemuel Gulliver under somewhat similar circumstances in Laputa, profess myself to be "not skilful enough to comprehend." What is shown seems to me to be that in modern not less than in ancient times men will run their heads against the multiplication table, and that for the passing moment, at least, it is not always the heads which come off second best in the encounter.

Of the second difference between the old world and the new which our command of methods and means, our recognition of the futility of attempting enterprises with a *manus nuda* and an *intellectus sibi permissus*, has created, the gas, glass, and coal around us in this room speak, and I need not.

As regards the third great point of contrast upon which Herr Hehn insists, that of natural science, we are all probably at one with him. Our agreement may be illustrated by contrasting the different factors which two poets, each an artist capable of taking a wide view with due perspective and proportion of the sum of man's activities, have in ancient and modern times respectively enumerated as making up that sum. When Juvenal specifies what he means by "*Quidquid agunt homines*," the comprehensive title of his satires, he enumerates nothing because, I suppose, he considered all else as beneath the dignity of a poet, but

"Votum, timor, ira, voluptas,  
Gaudia, discursus"—

large enough matters, but imponderables all of them. Contrast these items,—I purposely speak in Philistine phraseology—with those which our present Poet-Laureate enumerates in epexegetis of the "march of mind;" there we have the line:

"In the steamship, in the railway, in the thoughts that shake mankind"

—ponderables and imponderables severally holding their due mutual proportion. And from this line I can pass in this place by a natural and locally suggested transition to what I believe to be as large a difference between the ancient and modern world as either of the two last touched upon. The whole of the old world, of the *orbis veteribus notus*, of *πᾶσα ἡ οἰκουμένη*,

was but a small fragment as measured by the geographer when compared with the world dealt with our emigration agents and Custom-house officers. The discovery of America has been said to have exercised much the sort of influence upon the old world, socially and politically, that the approximation to our globe of some new planet would exercise astronomically; and since those "spacious times of great Elizabeth" China, Japan, Australia, and Polynesia have each entered into the circle of influences acting upon and acted on by the world as known to the classical writers. In speaking of any district beyond those in relation with the valleys of the Euphrates, the Danube, the Rhine, the Rhone, and the shores of the Mediterranean and Black Sea, the ancients would but say in really pathetic antithesis:

*"Longa procul longis via dividit in via teris."*

The Brindisi mail brings every manager of a museum, as well as every secretary for the colonies, into weekly relation with "regions Cæsar never knew," by agencies of which he never dreamt and of which in our own times the greatest perhaps of his successors, fortunately for us, as he is reported to have remarked in Plymouth Sound, never learnt to avail himself. And it is in reference to the all-pervading intercommunication which the application of steam to navigation has rendered possible that I wish to utter two concluding sentences, not respecting the vast contrast which it has set up between the present and all preceding centuries, but respecting the contrast which it will shortly have created between the present and all future times. Before this application had established highways on the ocean and invented machinery which

*"Spurning sails and scorning oars,  
Keeps faith with time on distant shores,"*

it was possible on many an oceanic island to recover links which had fallen out of the chain of evidence as to the origin of species which the older and larger continents of dry land had furnished; it was possible also to elucidate the origin, humble and lowly enough, of our own civilisation by what we could see, and not less by what we might fail to discover, in the inchoate civilisations, in similar localities, of semi-savage men. The lines of intercommunication between the most distant parts of our globe, which the navigator with, in his own language, "a steam-engine under his foot," is daily weaving into a more and more nearly all-encompassing web, will very

shortly have introduced so much of the most recent results of our modern civilisation into what were but lately the most secluded of localities as to rob them of that value and interest for the pursuers of the knowledge specified, which they up to a few years ago so eminently possessed.

These few years—for they will be but few—to come, have a great responsibility put upon them in the way of preserving those perishable and destructible links in the history of the past, which may be made incandescent and luminous for the advancement of knowledge, and to some not inconsiderable extent for the benefiting of man's estate.

In this work the Society, which has honoured me by inviting me to address them this evening, has borne a distinguished part in the past, and I cannot doubt, but, on the contrary, have many reasons for believing, that it will bear an increasingly important one in the future.

V.—*Notes upon some Astronomical Observations made in Kordofan and Darfur.* By Major H. G. PROUT, Corps of Engineers, Egyptian General Staff.

[Communicated by General STONE, Chief of the Staff, Cairo.]

[With Map.]

I. KORDOFAN.

*Khartum.*—The position of Khartum was fixed as follows:—The latitude was obtained from circum-meridian altitudes taken with a sextant and artificial horizon. Six different stars were observed. A total of seventy-seven observed altitudes was taken, thirty-five south of the zenith, and forty-two north. The final mean was  $15^{\circ} 37' 03''.68$ ; the greatest single result was from a north star, viz.,  $15^{\circ} 38' 20''$ ; the least single result was from a south star, viz.,  $15^{\circ} 36' 26''$ —a range which indicates a considerable error of eccentricity, the effects of which are disagreeably evident in the longitude determinations.

The longitude of Khartum was determined by lunar distances of Jupiter and Antares east, and Pollux and Regulus west of the moon. Twenty-two groups of distances were taken, each group consisting of three observed distances. The distances east were about equal in number and position to the distances west. The final mean was 2 h. 11 m. 34.61 s. ( $32^{\circ} 53' 39''.2$ ) east



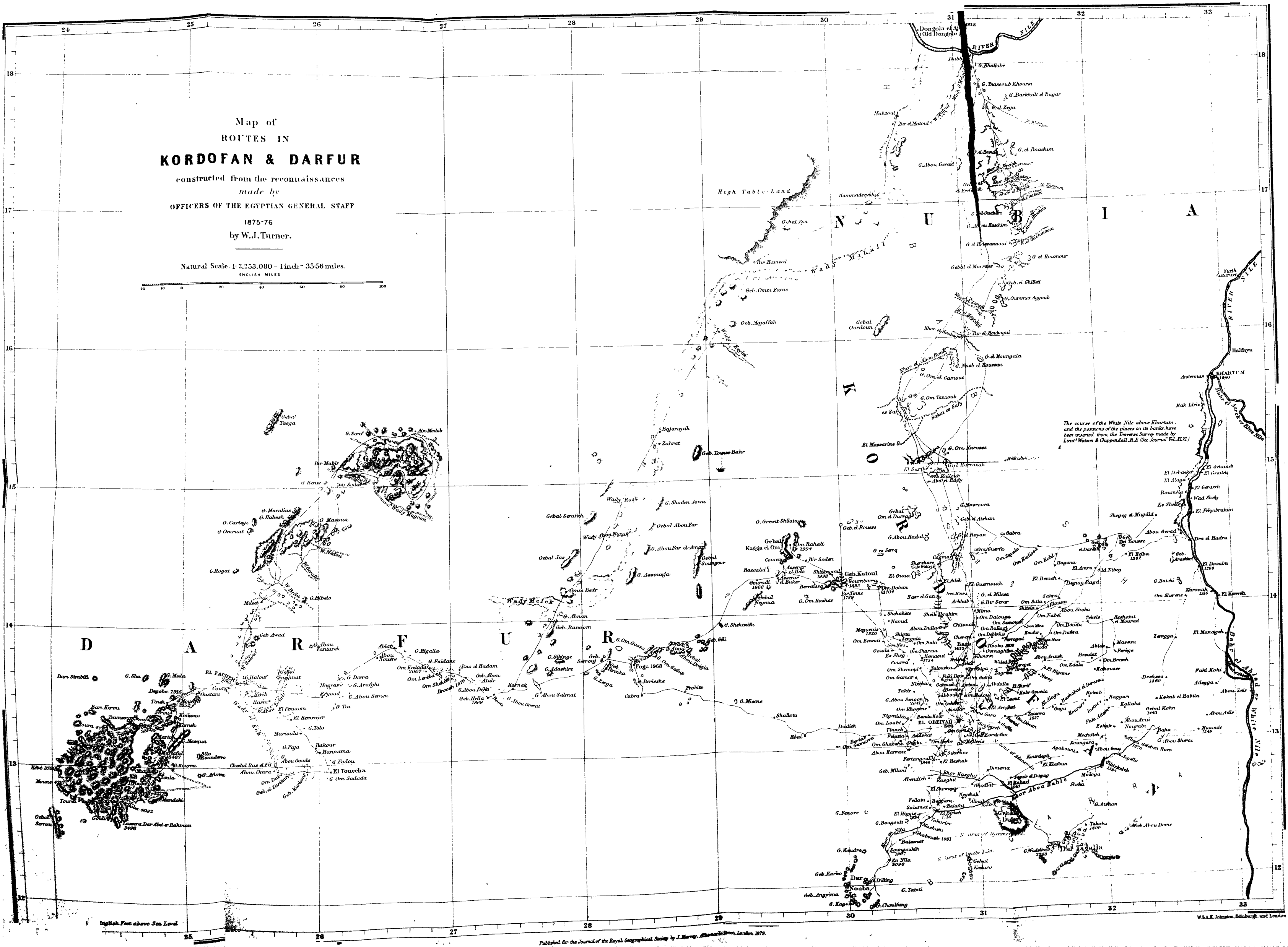
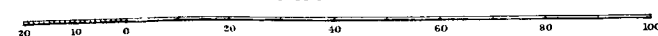
Map of  
ROUTES IN  
**KORDOFAN & DARFUR**

constructed from the reconnaissances  
made by  
OFFICERS OF THE EGYPTIAN GENERAL STAFF

1875-76  
by W.J. Turner.

Natural Scale 1:2,253,080 - 1 inch = 35.56 miles.

ENGLISH MILES



The course of the White Nile above Khartoum and the positions of the places on its banks have been ascertained from the Traverse Survey made by Lieut. Watson & Chappendall, R.E. (See Journal Vol. XLVI.)





of Greenwich; the greatest single result was 2 h. 13 m. 27.6 s. by Jupiter east; the least single result was 2 h. 08 m. 59 s. by Pollux west—a range of 4 m. 27 s. of time. Possibly it is considerably better than any previous determination of this longitude. It is due to the observer to say that he had but one sextant, therefore synchronous observations of distance and altitude were impossible. The sextant had an error of eccentricity varying greatly and irregularly for different parts of the arc; but I had not time to make the observations necessary to determine this error with sufficient exactitude. The only formulæ and tables at my command for reduction were those in Bowditch's 'Navigator,' edition of 1868.

*El Obeiyad.*—The latitude was obtained from circum-meridian altitudes of stars north and south of the zenith. Thirty-eight observed altitudes were taken, giving a final mean of  $13^{\circ} 10' 04''.04$ . The greatest single result was from a north star  $13^{\circ} 10' 43''.6$ ; the least was from a south star  $13^{\circ} 09' 53''$ . The probable error of the final mean I have not computed; but it will certainly be but a few seconds.

The longitude of El Obeiyad was determined by lunar distances, and by eclipses of Jupiter's satellites; and, like the longitude determinations at Khartum, it is very unsatisfactory.

Careful observations were obtained of the sun on September 29, 1875, which, when computed, will give a valuable check on the longitude.

Lunar distances were taken of Mars and Jupiter east, and of Mars, Jupiter, and Regulus west; in all thirteen groups of observed distances each; and three observations were obtained of Jupiter's satellites. The final mean is 2 h. 03 m. 26.24 s. ( $30^{\circ} 48' 33''.6$ ) east of Greenwich. The least single result is 1 h. 57 m. 31 s. by a western distance; the greatest is 2 h. 05 m. 36 s. by an eastern distance. The mean by the satellites of Jupiter is 2 h. 03 m. 57.87 s. The increased range in the single results is probably due to the fact that it was thought better to attempt no correction of the observations for eccentricity, but to trust to a careful selection of the east and west positions, so that they should be about equal in number and distance.

Here, as at Khartum, the observer had no assistant to observe the altitudes, nor any of the improved tables or formulæ for reduction.

No attempt was made to determine independently any other longitudes than those of Khartum and El Obeiyad; but all the longitudes on the map have been referred to those two

points. The longitudes of all points on the Nile, and for some ten miles west of the Nile, depend upon Khartum; all other longitudes depend upon El Obeiyad. It follows, then, that when the longitudes of Khartum and El Obeiyad are determined by electric telegraph (which might now be done), the corrections of all the longitudes of the map can be easily made.

The material for the construction of the map has been obtained from the following reconnaissances, viz.:—

Major Prout: Khartum to El Obeiyad, 232 English miles.

Major Prout: El Obeiyad *viâ* Hemaoui and Meguéni, to Gebal Kaggâ and return *viâ* Meguéni and Abou Senoon, 275 miles.

Major Prout: El Obeiyad to Dar Nouba, Gebal Tagalla, and the White Nile, and return by Gebal Kohn, 575 miles.

Adjutant-Major Hamdy, acting under the orders of Colonel Colston: Es Safy to El Obeiyad, 196 miles.

Adjutant-Major Hamdy: El Obeiyad to Ferège and return, 221 miles.

Adjutant-Major Hamdy: El Obeiyad to Shershare, thence easterly to Shegeg, and return *viâ* Khoursi, 354 miles.

Lieutenant Yussuf Helmy and Lieutenant Haliel Fouzy: El Obeiyad to El Birkeh, thence *viâ* El Rahad to Gebal Kohn and return, 259 miles.

Two expeditions to Abou Harraze and Gebal Abou Senoon.

In all these expeditions the linear distance has been determined by the time of marching, and the direction by the prismatic compass. It is only on the routes of Major Prout that any astronomical checks have been made; still these have often been sufficient to give some slight control of the positions determined by the various officers, and to convince one that the work with prismatic compass and watch has been carefully done.

The astronomical checks on the routes of Major Prout have been—1st. Latitude by direct determinations; 2nd. Longitudes by computed difference of longitude between two points, having the difference of latitude and the azimuth of the line connecting the points.

*Latitudes.*—In the entire area of the map, the positions of which the latitudes have been independently determined, are twenty-one in number. The following is a list of the positions, with the number of the observations, the bodies observed, and the mean result:—

Place.	No. of Observa- tions.	Body Observed (N. or S.).	Mean Result.
			° ' "
Khartum .. .. .	77	$\left\{ \begin{array}{l} \gamma \text{ Ursæ Maj., N.} \\ \beta \text{ Corvi, S.} \\ \beta \text{ Ursæ Min., N.} \\ \beta \text{ Scorpii, S.} \\ \eta \text{ Draconis, N.} \\ \alpha \text{ Ursæ Maj., N.} \end{array} \right.$	15 37 04
Tira El Hadra .. .. .	20	$\left\{ \begin{array}{l} \gamma \text{ Ursæ Maj., N.} \\ \beta \text{ Corvi, S.} \end{array} \right.$	14 20 17
Bara .. .. .	25	$\left\{ \begin{array}{l} \alpha \text{ Libræ, S.} \\ \beta \text{ Scorpii, S.} \\ \eta \text{ Ursæ Maj., N.} \end{array} \right.$	13 42 13
El Obeiyad .. .. .	35	$\left\{ \begin{array}{l} \beta \text{ Ursæ Min., N.} \\ \beta \text{ Scorpii, S.} \end{array} \right.$	13 10 04
Meguénis .. .. .	19	$\left\{ \begin{array}{l} \beta \text{ Draconis, N.} \\ \gamma \text{ Draconis, N.} \\ \text{Mars, S.} \end{array} \right.$	13 50 18
Goumbarra (Gebal Katoul) .. ..	..	$\left\{ \begin{array}{l} \gamma \text{ Draco., N.} \\ \text{Mars, S.} \end{array} \right.$	14 12 37
Bir Soderi (near Kagga) .. ..	12	Mars, S.	14 25 25
Fertangoul .. .. .	13	$\left\{ \begin{array}{l} \alpha \text{ Cassiopeïæ, N.} \\ \beta \text{ Ceti, S.} \end{array} \right.$	12 54 37
El Birkeh .. .. .	22	$\left\{ \begin{array}{l} \alpha \text{ Cassiopeïæ, N.} \\ \beta \text{ Ceti, S.} \end{array} \right.$	12 33 03
En Nila .. .. .	12	$\left\{ \begin{array}{l} \alpha \text{ Cassiopeïæ, N.} \\ \beta \text{ Ceti, S.} \end{array} \right.$	12 12 21
El Rahad .. .. .	25	$\left\{ \begin{array}{l} \alpha \text{ Cassiopeïæ, N.} \\ \text{Sun, S.} \end{array} \right.$	12 40 40
Wadelka .. .. .	11	Sun, S.	12 14 41
Takoba .. .. .	12	Sun, S.	12 22 34
Shirkéleh .. .. .	24	$\left\{ \begin{array}{l} \text{Sun, S.} \\ \alpha \text{ Persei, N.} \end{array} \right.$	12 48 24
Muaouèle .. .. .	20	$\left\{ \begin{array}{l} \text{Sun, S.} \\ \alpha \text{ Persei, N.} \end{array} \right.$	13 02 14
Faki Kohi .. .. .	39	$\left\{ \begin{array}{l} \text{Sun, S.} \\ \alpha \text{ Persei, N.} \end{array} \right.$	13 23 36
Karanak .. .. .	15	Sun, S.	13 46 41
Duème (El Dooaim) .. .. .	27	$\left\{ \begin{array}{l} \text{Sun, S.} \\ \alpha \text{ Persei, N.} \end{array} \right.$	13 59 30
Gebal Kohn .. .. .	22	$\left\{ \begin{array}{l} \text{Sun, S.} \\ \alpha \text{ Persei, N.} \end{array} \right.$	13 12 35
Taiarra .. .. .	22	$\left\{ \begin{array}{l} \text{Sun, S.} \\ \alpha \text{ Persei, N.} \end{array} \right.$	13 13 01
Gebal Kordofan .. .. .	16	Sun, S.	13 04 56

In every instance the error of the timepiece used in the observations has been determined with sufficient precision. The observations have been taken on both sides of the meridian, and within ten minutes of the time of culmination, and the reduction to the meridian has been made by the formula  $x = k \left( i \frac{\cos L \cos D}{\cos a} \right) - m \tan a \left\{ i \frac{\cos L \cos D}{\cos a} \right\}^2$ , where

$$k = \frac{2 \sin^2 \frac{1}{2} p}{\sin 1''}, m = \frac{2 \sin^4 \frac{1}{2} p}{\sin 1''}, a = 90^\circ + D - L, L = \text{assumed}$$

latitude,  $D$  = declination of body,  $p$  = its hour angle, and  $x$  = correction in seconds. The values of  $k$  have been taken from Lee's Tables. In the reductions the second term  $\left( m \tan a \left\{ i \frac{\cos L \cos D}{\cos a} \right\}^2 \right)$  has not been used.

The bodies observed have been so chosen that the altitudes north of the zenith were nearly equal in number and position to those south of the zenith, thus eliminating, as far as practicable, instrumental errors. In all cases where the error of eccentricity was not thus eliminated, the latitude has been corrected for that error as deduced from other observations.

Not only have the bodies been carefully selected, and the methods of reduction been the most exact practicable, but each individual altitude was taken with conscientious care. In the whole number of observations made, probably not more than six observed altitudes were rejected in the final computations, and I have no hesitation in presenting the results as worthy of great confidence.

*Longitudes.*—The positions connected in longitude with El Obeiyad by the method of the difference of latitudes and observed azimuths are—

1. Gebal Abou Senoon,	determined from El Obeiyad.
2. Gebal Megüenis,	„ Abou Senoon.
3. Goumbarra (Gebal Katoul),	„ Abou Senoon.
4. Gebal Kaggä,	„ Katoul.
5. Gebal Kordofan,	„ El Obeiyad.
6. Fertangoul,	„ G. Kordofan.
7. El Rahad,	„ G. Kordofan.
8. Gebal Daïer,	„ G. Kordofan.
9. Wadelka,	„ Gebal Daïer.
10. Gebal Kohn,	„ Gebal Daïer.
11. Taiarra,	„ Gebal Daïer.

I do not ask much confidence in the longitudes of the map. The determinations just mentioned have a certain value as checks upon the work with prismatic compass and watch. They are more exact than any independent determinations which I

might have made by lunar distances or eclipses, except by a long series of observations; for such a series I had not time.

The principal sources of errors in these determinations are—

1st. They are affected by errors in the longitude of the initial points.

2nd. The azimuths were determined with a magnetic compass too small for great precision; and only at El Obeiyad was the magnetic declination accurately known.

3rd. It was often (usually, in fact) impossible to get the azimuths between precisely the same points at which the latitudes had been found.

## II. ROUTE FROM EL OBEIYAD TO EL FACHER.

The position of El Facher has been determined as follows:—

*For Latitude by Circum-Meridian Altitudes, N. and S.*

Lieut.-Colonel Mason	..	49	Observed Altitudes	..	13° 36' 25"
Major Prout	.. ..	100	Observed Altitudes	..	13 36 29
			Mean adopted	.. ..	13 36 27

*For Longitude by Eclipses of Jupiter's Satellites.*

Lieut.-Colonel Mason	..	10	Observations	..	1 <sup>H.</sup> 41' 35" = 25° 23' 45"
Major Prout	.. ..	7	Observations	..	1 <sup>H.</sup> 41' 37.8" = 25° 24' 27"
			Mean adopted	.. ..	1 41 36.4 = 25 24 06
					(East of Greenwich.)

As the observations of Colonel Mason were entirely independent of my own as to instruments and methods of reduction, I think that the results are remarkably close and perfectly reliable.

On the route from El Obeiyad to El Facher no attempt was made to determine longitude; but the latitude was found at three intermediate points.

In the final plotting of the prismatic compass line, the total error was distributed over the whole line; and the errors in latitude between the astronomical stations were distributed over the lines between these stations.

NOTE.—In constructing the map of Kordofan and Darfur accompanying the above paper, advantage has been taken of other reconnaissances made by officers of the Egyptian General Staff, besides those mentioned by Major Prout. These are generally beyond the area embraced in the map of Kordofan compiled by him, or have been made subsequently. They are as follows:—

Major Prout: El Obeiyad to El Facher.

Colonel Colston: Dabbe to El Obeiyad.

Colonel Purdy: Old Dungola to El Facher; upon which the determinations of latitudes and longitudes were made by Lieut.-Colonel Mason.

Lieutenant-Colonel Mason: El Facher to Gebal Medob, and return.

Captain Mahmoud Sami, under the orders of Colonel Purdy: El Facher to El Touecha, and return.

Lieutenant Mahir, under the orders of Major Prout: From El Facher round Gebal Marrah, and return.

W. J. TURNER, R.G.S.

## VI.—*Zeno's Frislanda is Iceland and not the Færoes.* By Admiral IRMINGER.

[With Map and Diagram.]

AMONG the voyages of discovery of former times, few have excited more attention among Geographers than the voyages of the Venetian nobles, the brothers Nicolo and Antonio Zeno, to the northern seas, towards the close of the fourteenth century; an account of which was published under the title of 'Dello Scoprimento dell' Isole Frislanda, Eslanda, Engroneland, Estotiland, e Icaria, fatto per due fratelli Zeni, M. Nicolò il Cavaliere, e M. Antonio,' with a map, 'Carta da Navegar de Nicolo et Antonio Zeni furono in tramontana lano MCCOLXXX.' The latest edition of this work, including the original and an English translation, with notes and introduction, is that by Mr. R. H. Major, published in 1873 by the Hakluyt Society.

Many eminent scholars and critics have discussed the Zeno narrative; some arriving at the conclusion that it is untrustworthy or even fictitious, and others that it has much merit. Humboldt says: "On y trouve de la candeur et des descriptions détaillées d'objets, dont rien en l'Europe ne pouvoit leur avoir donné l'idée."\*

As I have been frequently in those waters, and, besides sailing in the open sea between the islands, have stayed for a long time in Iceland and the Færoe-islands, the old narrative of the Zeni has been from an early date of interest to me, and I have followed the later criticisms of it with constant attention.

Some few years since, I took occasion to inform the eminent geographer, Mr. Clements Markham, that my conception of various points in the Zeno voyage did not agree with that of Mr. Major and Admiral Zahrtmann, especially with regard to their identification of the mystic "Frislanda" with the "Færoe-islands." I now take the liberty of submitting to the

\* Hakluyt edition 1873, Introduction, ix.







Royal Geographical Society the grounds on which I differ from the above-named authorities.

I will give, first, my critical annotations to Mr. Major's various statements, and then my individual opinion as to the solution of the question in its entirety, constantly referring to the Hakluyt Society's edition of 1873.

At page 6 we read the following:—

"Zichmni then, being such as I have described him, was a warlike valiant man, and especially famous in naval exploits. Having the year before gained a victory over the King of Norway, who was lord of the island, he, being anxious to win renown by deeds of arms, had come with his men to attempt the conquest of Frislanda, which is an island somewhat larger than Ireland. Whereupon, seeing that Messire Nicolò was a man of judgment, and very experienced in matters both naval and military, he gave him permission to go on board his fleet with all his men, and charged the captain to pay him all respect, and in all things to take advantage of his advice and experience. This fleet of Zichmni consisted of thirteen vessels, whereof two only were rowed with oars, the rest were small barques and one ship. With these they sailed to the westwards, and with little trouble gained possession of Ledovo\* and Ilofe† and other small islands in a gulf called Sudero, where, in the harbour of the country called Sanestol,‡ they captured some small barques laden with salt fish. Here they found Zichmni, who came by land with his army, conquering all the country as he went. They stayed here but a little while, and making their course still westwards, they came to the other cape of the gulf, and then turning again, they fell in with certain islands and lands which they brought into possession of Zichmni. This sea, through which they sailed, was in a manner full of shoals and rocks; so that had Messire Nicolò and the Venetian mariners not been their pilots, the whole fleet, in the opinion of all that were in it, would have been lost, so inexperienced were Zichmni's men in comparison with ours, who had been, one might say, born, trained up, and grown old in the art of navigation. Now, the fleet having done as described, the captain, by the advice of Messire Nicolò, determined to go ashore at a place called Bondendon;§ to learn what success Zichmni had had in his wars, and there, to their great satisfaction, they heard that he had fought a great battle, and put to flight the army of the enemy; in consequence of which victory, ambassadors were sent from

\* Little Dimon.

† Skuó.

‡ Sandó.

§ Norderdahl.

all parts of the island to yield the country up into his hands, taking down their ensigns in every town and village. They decided therefore to stay in that place to await his coming, taking it for granted that he would be there very shortly."

And further, at page 9.

"Departing thence, they went in triumphant manner towards Frislanda,\* the chief city of the island, on the south-east of it, lying inside a bay, in which there is such abundance of fish that many ships are laden therewith to supply Flanders, Brittany, England, Scotland, Norway, and Denmark, and by this trade they gather great wealth."

As Zichmni came by land, Sanestal (Major's and Zahrtmann's Sandóe) must have been on the same continuous land as the place from whence he had journeyed thither. The island Sandó, through which I myself have travelled twice from north to south, and am therefore well acquainted with the localities, has indeed a few dwellings at "Sand," around a small bay with anchorage, though open for southern winds, which frequently cause a very heavy sea against the land. On that insignificant spot Zichmni is said to be with his army.† From whence he came is not said, but by land it is not possible to come to that little island.

I may remark as a well-known fact that on the Færoe-islands the preparation of fish with salt (Klipfisk) was not practised before the present century; before that time dried fish without salt (Stokfisk) only was prepared; I will not, however, urge this as a principal and decisive argument.

At page 6:—"This sea through which they sailed from Sanestal to Bondendon was in a manner full of shoals and rocks," &c.

From this place Sanestal, Zichmni, of course, intended to go to the conquest of Frislanda (Major's Færoe-islands), but casting a glance on the chart of the Færoes, and following the line which the fleet with Nicolò Zeno on board is said to have sailed, it perplexes me that the fleet at the outset were not directed to Skaapen, a landing-place on the northern side of Sandó, in order to transport the army to Stromó (Major's Frislanda), for the purpose of conquering it. What, at any rate, had the fleet to do at Bondendon (Mr. Major's and Admiral

\* Thorshavn.

† According to Mr. Major's edition, 1873. See the route on the Færoe chart.

Zahrtmann's Norderdahl), leaving the army on the little scantily-peopled Sandó, Sanestal not being continuous land with Frislanda? Mr. Major and others may believe that the word "Norderdahl" to a southern ear sounded like "Bondendon;" but this would not justify the fleet's sailing to Norderdahl.

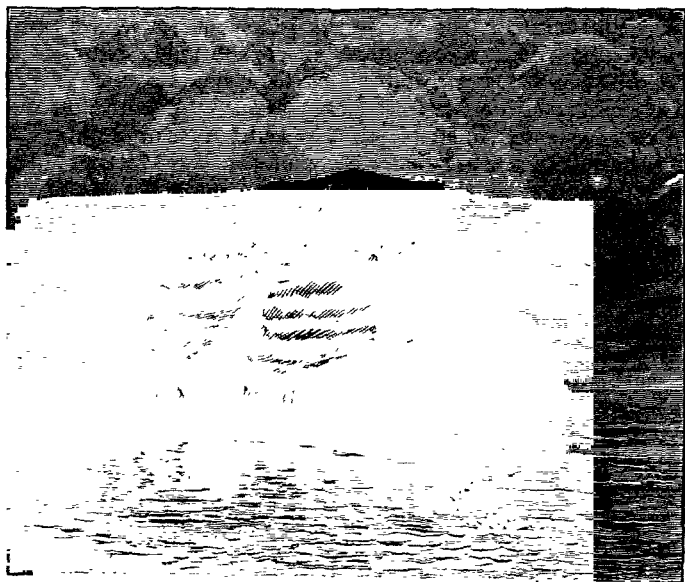
The navigation from Sanestal to Bondendon is, in the Italian narrative, described as perilous through the many shoals and rocks; but this does not agree with the actualities at the Færoe-islands; the insignificant distance of 14 to 15 miles, westward of Sandó, passing by the small islands Trolhoved, Hestó, and Kolter, to Norderdahl, being quite clear water. Hestó and Kolter are towering, steep-to, rocky islands surrounded by good water. Trolhoved is a smaller and lower uninhabited rocky island; but so free from obstacles that you may go so close in shore as to touch the rock with your jib-boom. There is no anchoring-ground, however, in the Sound at Norderdahl; but often a strong current and heaving of the sea, the coast being rocky, steep-to: and on such an exposed place Mr. Major supposes that the fleet had thought fit to wait for Zichmni's arrival. The coast in its whole length, from Norderdahl to the southernmost part of Stromó, is somewhat steep-to and rocky, where no dwellings, except little farms, have ever existed. Norderdahl, Sydredal, Velbastad, Kirkebó, and Bó, where some grass-plots may be found, but only near the houses, just sufficient for the few cattle and sheep, the produce of corn being very small. I have several times passed between Thorshavn and the southern part of the island. The whole southern part, the above-named grassy plots excepted, as well as the inner part of Sandó, exhibit nothing but rocks and sterile stony tracts, and is therefore uninhabitable. Certainly the triumphal march of Zichmni cannot have taken place on the Færoe-islands, from Sanestal to Thorshavn, but must certainly have passed through a larger land-area and with greater population. From Slattaretind on the north side of Osteró, another of the Færoes, about 3000 feet above the level of the sea, the highest point of the island, I have overlooked the whole group, the ocean all around, and the deep Sounds between all those small steep rocky islands; and am convinced that, from whatever high point of any of these islands Zeno might have formed an idea of the extension of the same, as an experienced sailor he would never in his '*Carta da Navegar*' have laid down, as he has done, the Færoes as a single island somewhat greater than Ireland.

At pages 25 and 26 we find in Mr. Major's edition:—

"Steering westwards, we discovered some islands subject to

Frislanda, and passing certain shoals, came to Ledovo,\* where we stayed seven days to refresh ourselves and to furnish the fleet with necessaries. Departing thence we arrived on the 1st of July at the island of Ilafé;† and as the wind was full in our favour, we pushed on."

Let us examine that island, Little Dimon, of which I sub-join a sketch. Little Dimon rises steep out of the almost constant heavy seas of the North Atlantic; it is 1299 feet high, and its greatest diameter at the level of the sea is about half a mile (between 3000 and 4000 feet). There is no port, no



anchorage, no lee-side; almost always breakers, more or less, against that almost perpendicular rocky coast; very often, through the strong tide, races whirling round the island, increasing in violence. The island is abordable only at one single point, and this only in calm weather; it is besides so steep-to, that one ought to be accustomed to climb almost perpendicular rocks to get ashore, and no fresh water is to be found. *Certainly the fleet stayed not here, at this uninhabitable spot, for refreshment and necessaries, where nothing is found but rock and a little grass.*

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\* Little Dimon.

† Skuó.

Ilæfe (Mr. Major's Skuó) is larger than Little Dimon and inhabited, but it also is a high rocky island. Ilæfe, with Great and Little Dimon, present themselves as lying close to each other, and are, through their little distance respectively from each other, to be seen distinctly at the same time.

The narrative does not give the time at which the fleet left Ledovo (Little Dimon), but states only that it arrived at Ilæfe on the 1st of July. I suppose that the distance from Ledovo to Ilæfe must have been greater than from Little Dimon to Skuó, which is only 7 or 8 miles, a distance that may easily be made in an hour.

By the name of Frislanda, then, Zeno cannot have meant the *Færoes*. So large an island as he described, south of Iceland, indeed never existed. The old Northmen who, many centuries before Zeno, crossed the Northern Atlantic on their voyages to Iceland and Greenland, shaping their course south of Iceland, never mention the great island "Frislanda;" neither on the many voyages between England and Iceland, before the time of Zeno, had that great land been seen.

John Dee\* sets forth that the Franciscan, Nicolaus de Linne, who in 1360 voyaged in the northern seas, and published a book thereon, entitled 'Inventio Fortunata,' set out from the harbour Linne (now King's Lynn in Norfolk), from whence, with ordinary winds, it is fourteen days' sailing to Iceland, which "had bene of many yeeres a very common and usual trade." By Acts of Edward III., 2nd, 5th, and 31st year, the fishermen of Blakey, in Norfolk, were freed from the King's ordinary service, on account of their commerce on Iceland, but no mention is made of Frislanda.

But what island may Zeno have meant to indicate by his "Frislanda"? I believe that an examination of the relations which at that time existed between Europe and the islands of the North Atlantic will show us this.

As neither the fisheries at Newfoundland nor at Lofoden, Norway, were known at that time, and as the Catholic religion was then predominant over all these northern countries, Germany, England, Denmark, Norway, and nearly over the whole of Europe, where in Lent there was a great consumption of fish, of which "stokfisk" (dried fish) was one of the principal supplies, the fish-trade of course was carried on principally in Iceland, whose surrounding waters were renowned for their extraordinary riches in fish. Zeno asserts that in Frislanda there was such abundance of fish, that many ships were laden therewith, to supply Flanders, Brittany, England, Scotland,

\* 'Nordisk Tidsskrift for Oldkyndighed,' 2nd Bind, Kiöbenhavn, 1833, page 26.

Norway, and Denmark; and that great wealth was earned by the trade.

On Martin Boheim's globe, constructed in the year 1492, we read:—"In der Insel Island, fängt man den Stockfisch, den man in unser Land bringt." The trade on Westmanó, south of Iceland, where the sea abounds with fish, appears to have been very considerable. Amongst English merchants there are named, in 1419,—Raffin Tirrington, John Effrardh, Thomas Ladsel, Nicles Wanflit, and Richard Plebel; and amongst their clerks, Robert Bulington, Richard Brillenton, John Wachfield, John Durdley, and Richard Stokeley, most of whom dwelt there and traded throughout the winter.\* As to such abundance of fish in these old days in the Færoes, nothing is known.

With regard to this commerce with Iceland, I note from Icelandic sources the following items :†—

About the year 1400, Englishmen gained an absolute supremacy in the trade on Iceland. They ill-treated the Icelanders, and incredible were the injuries they perpetrated—rapines, pillage, mutiny, and manslaughter.

In the year 1419 Thorsley Arnesen sailed from Iceland in order to represent to the King of Denmark the calamities brought on the inhabitants by the pillages of foreigners. On the voyage he was surprised by an English vessel, whose assault, however, he repelled, and took refuge first at the Færoes, lastly in Norway.

In 1420 English ships, under John Marris and Rawlin Tirrington, traded on Westmanó, where they robbed nine lasts of the king's dried fish.

On the coasts of North Iceland, in Skagafjord, the crews from three ships landed in full battle array, with trumpets and flying ensigns. They slew there a royal officer, John Ide, wronged the administrator at Holum in the presence of the bishop, besides practising robberies and other crimes.

In 1424 the English seized and plundered for the fourth time Bessestad (then the residence of the bailiff), near Reikiavik, carried away, among other goods, six lasts of dried fish, slew one Anders Olsen, and wounded and seized many others of the king's men, &c. &c. The ringleaders named are John Percy, John Pasadal, and Thomas Dale. On one or more adjacent islands the English had places of refuge, surrounded with entrenchments. Westmanó was ravaged repeatedly; a quasi peace was concluded, but soon broken. The English pursued the royal officers even on the main land. Near the church of

\* 'Nordisk Tidskrift for Oldkyndighed,' 2nd Bind, 1833, page 138.

† Ibid., Finn Magnussen, 'Om de Engelskes Wandel paa Island.'

Saurbay, on the southerland of Iceland, they carried away with them some horses, arms, swords, &c.

In 1425 the English continued their hostilities under the leadership of Percy. On Westmanó they seized the royal commanders Hanne Poulsen and Balthasar van Damme, whom they carried away with them as prisoners to England, &c.

In one of the preceding years the pirates burnt down the church on Risó and Husevig on the northland of Iceland, likewise the church on Primsó, carrying away a multitude of cattle and sheep; even many persons, grown men and children, as prisoners.

But enough of the injuries perpetrated by foreigners in Iceland. I must not omit, however, to note that in the year 1394 a somewhat significant skirmish took place at Budarhófdi,\* one of the oldest commercial places in the inner part of Hvalfjörð (Faxebay), between the inhabitants and foreign sailors, as this perhaps is about the date of the expedition of Zichmni to Frislanda recorded in Zeno's Italian narrative. I may note, further, that in order to prevent the atrocities of foreigners in Iceland, Queen Margaret of Denmark in 1389 prohibited all foreigners from trading in Iceland and Greenland, although many Icelandic records prove how powerless those prohibitions were against the overmatching crowd of foreigners, with the piracy and violence which were often intermingled with peaceable commerce. The Danish king, Eric the Pommeran, had, before 1411, issued a decree strictly prohibiting all commerce in Iceland with English seamen other than those with whom it was customary to trade; and an English merchant, Richard, at the Westfjörð in Iceland, presented the king's sea-passport and thereby was admitted to trade; but at the same time English fishermen, especially from Lenne (Lynn), London, Fernemouth (Yarmouth), and others, pillaged on various parts of the coast.

In the year 1413 thirty English fishing-vessels are enumerated as being in Iceland; besides English merchant-vessels, amongst which five to Westmanó; in the year 1415 six English merchant-vessels were in Havnefjörð, one of which was freighted for the king's feoffee of Iceland, Vigfus Iversen Halm, who, with sixty lasts of dried fish and a quantity of silver money, sailed to England.

On Maundy-Thursday, 13th of April, 1419, in a horrible hurricane, with showers of snow, lasting only three hours, not less than 25 English fishing-vessels were wrecked at Iceland, the cargoes and wrecks covering the coasts; all the crews, however, were drowned in the waves.

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\* Budarhófdi is now a commercial place, laid down many years ago.



Nowhere in the annals and records of Iceland does the name of Frislanda occur, or is even hinted at.

Evidently the expedition (assault and pillage) of Zichmni on Frislanda, as described by the Zeni, fits remarkably well as one of the cases of piratical assaults above enumerated as committed in Iceland by foreigners—it fits both in respect to date and to the character of the attack. The position with respect to latitude and longitude is obvious: "Estland" (Shetland), laid down close to Norway, a long island between  $67\frac{1}{4}^{\circ}$  and  $70\frac{1}{2}^{\circ}$  of latitude, named "Islanda," has not the least conformity with Iceland; a multitude of islands laid down on the north-east side thereof do not exist, but have got names which point to Shetland; the configuration and position of Islanda are unjust to such a degree that, though the Latin names of Skalholt and Holum be found in the 'Carta,' we may, with surety, suppose that Zeno has traced the same after some loose account, which may be supposed to be the case with many other non-existent lands in his 'Carta.'

Malte-Brun's assertion (Major's Introduction, xxxviii) in his 'Précis de la Géographie universelle,' that Islanda "est bonne à l'exception de la partie Nord-Ouest," I cannot agree to. The 'Carta' itself furnishes, nevertheless, a clue to the solution of the question.

It is evident that "Frisland" in Zeno's 'Carta' has a great resemblance to Iceland, and is traced more accurately than the other lands in the 'Carta' as an island "somewhat larger than Ireland." Considering the poor material appliances in Zeno's time, especially the want of instruments, for laying down approximately true the whole configuration of a land, it is wonderful to what degree "Frisland" resembles the actual Iceland.

At that time the general amount of knowledge regarding Iceland was not insignificant, and Zeno, as a well-informed man, had certainly communicated with cultivated Icelanders, from whom he probably had the tracing.

The island "Islanda" laid down in the 'Carta,' a long way northward, is not to be regarded—the tracing showing itself as uncertain as that of Icaria, and many other non-existent places.

In a sea-chart on so small a scale as Zeno's, stretching from Europe to Greenland, Zeno would certainly not have laid down such an insignificant shoal as Sumbó-Munk (south of Færoe), placing it south of Frisland. Supposing Zeno's "Monaco" to be Westmanó, south of Iceland, at that time renowned for its extensive fish trade, and as its position south of Iceland, with its adjoining smaller islands, is pretty correct, then I do not hesitate to assert that Zeno may have intended by Frisland to signify

Iceland; meeting as we further do, on Iceland near the Westmanó, with Portland (Porlando); the trading-place Orebak (Ocibar), and Arnes-syssel (Aneses), discovering Suderó Colfo (the southern gulf), as Faxebugt and Colfo Norda (the northern gulf), as Bredebugt. Banar as Biarnar-hófn (on a chart of Iceland by Erichsen, dated 1780), a harbour situated between Cap Devia and Porti (harbours). Porti corresponds with Styk-kisholm with a safe harbour, known and frequented in old times, within smaller rocky islands and shoals; from the neighbourhood of which harbour the greatest part of the most renowned discoverers of Greenland and America set out from Iceland, therefore probably calling the place "Porti" (harbours). Farther northwards we meet "Bondendon" as Budardalr, Andefort as Arnarfiód, Spagia as Skagen. Rané corresponds with Randanæs; on the western side is situated the well-known Roverhavn (Robber-harbour); Lagostlos as Lengenæs; Vadim as Vapna-Fiord; Rifu-Radea as Reidar-Fiord.\*

And now let us examine the Italian narrative, supposing "Frislanda" to be Iceland and its neighbourhood, and inserting the Icelandic places in the text.

In the Hakluyt Society's Edition, at page 7, we read:—

"Here (in Sanestál) they found Zichmni, who came by land with his army, conquering all the country as he went. They stayed here but a little while, and making their course still westwards, they came to the other cape of the gulf, and then turning again they fell in with certain islands and lands which they brought into possession of Zichmni. This sea through which they sailed was, in a manner, full of shoals and rocks; so that had Messire Nicolò and the Venetian mariners not been their pilots, the whole fleet, in the opinion of all that were in it, would have been lost, so inexperienced were Zichmni's men in comparison with ours, who had been, one might say, born, trained up, and grown old in the art of navigation. Now the fleet having done as described, the captain, by the advice of Messire Nicolò, determined to go ashore at a place called Bondendon, to learn what success Zichmni had had in his wars, and there, to their great satisfaction, they heard that he had fought a great battle and put to flight the army of the enemy," &c. &c.

The harbour "Sanestál" we place at the southern gulf (Suderó Colfo), Faxebugten. The position corresponds nearest with the actual trading-place, Budenstad, with its harbour. On the south side of Suderó Colfo lies Havnefiord, which, in olden times, had a large trade.

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\* Cf. the accompanying Map of Iceland.

If by "Sanestál" is not meant one of those places, probably it may signify the former trading-place, Budarhófdi, in Hvalfjörð, where, as related in the Icelandic annals, in the year 1394 a battle was fought between the inhabitants and foreigners or adventurers. The voyage from one of those places in the southern gulf, to Bondendón (Budardalur), in Colfo Norda, corresponds much better with the Italian narrative, than the voyage between the Færoe-islands, as before mentioned.

Having, during my long residence in different years in Iceland, travelled through the country, and therefore knowing the localities, I at first supposed in reading the Zeno narrative of the sailing from "Sanestál" to "Bondendón," that it aimed at a voyage from the actual Faxebugt (Súðeró Colfo), Icelandic "Súdr," into the actual Bredebugt (Colfo Norda)—Icelandic "Norðr"—where, in the inner part, we meet with many small rocky islands and ridges, which, as navigators at that time were not furnished with authentic charts, would make the navigation very troublesome and perilous. The course out of Súðeró Colfo (southern gulf) is westwards, as stated in the Italian narrative, and in order to get into Colfo Norda (northern gulf), Snefieldsnæs (Zeno's Cap Devia) must be passed. The peninsula which separates Faxebugt from Bredebugt is about 2000 feet high, ending in the western cape with Snefieldsjókul, about 5000 feet above the level of the sea, showing itself over the whole Faxe- and Brede-bugt, with its eternal ice and snow-masses covering about two-thirds of the height of the jökul, and, because of its height, looming rather nearer than it actually is. Of course they had to make a long roundabout from the inner part of Faxebugt, to get into the inner part—filled with many rocks and shoals—Bredebugt, where Budardalur (Bondendón) is situated, and thus it is significant that Zeno has named the western cape (Cape Snefieldsnæs) "Cap Devia," i.e. in Italian, "out of the way."

When Zichmni came to Sanestál, where the fleet met him, it is not dated in the Italian narrative, nor is it evident whither he went in Frislanda, leaving the fleet at Bondendón.

He may perhaps firstly have landed on *the southern coast of Iceland*, near to Westmanó, meeting the fleet at Havnefjörð, Budenstad, or Hvalfjörð, which may thus correspond with the Icelandic relation of the skirmish in that fjörð at Budarhófdi in the year 1394, thence, or from one of the other named places, Havnefjörð or Budenstad, he has perhaps continued his triumphant march through the country to Budardalur (Bondendón), where he met the fleet. That part of Iceland is the best peopled, and this route corresponds much better with the Italian narrative than the triumphant march through the almost unin-

habited and insignificant districts of the *Færoes* from Sandó to Thorshavn.

As to the position of the islands *Ledovo* and *Ilafe*, mentioned in the Italian narrative, and that of many other there-named places, I do not know where to lay them down, and feel compelled to seek the cause of that inexplicability in the fact that not till 1558, about 150 years after the death of the two brethren Nicolò and Antonio Zeno, the voyages in the north were edited by one of their descendants, their '*Carta da Navegar*' having been partly destroyed before.

Still I believe I have proved clearly, in the foregoing remarks, that "*Ledovo*" was not "*Little Dimon*;" it being impossible for a fleet in such a little uninhabited spot "to stay seven days to refresh ourselves and to furnish the fleet with necessaries."

I have now reached the end of my objections to the views of Mr. Major and Admiral Zahrtmann, respecting the mystic island, "*Frislanda*," of the Venetian brothers Zeno, and have given my own individual opinion in the matter. I will now touch on a few other obscure points or rather uncertainties we meet with in Zeno's narrative.

In Mr. Major's edition, at page 12, we read as follows:—

"Accordingly he fitted out three small barks in the month of July, and sailing towards the north arrived in *Engroneland*. Here he found a monastery of the order of Friars Preachers, and a church dedicated to St. Thomas, hard by a hill, which vomited fire like *Vesuvius* and *Etna*. There is a spring of hot water there, with which they heat both the church and the monastery, and the chambers of the Friars, and the water comes up into the kitchen so boiling hot, that they use no other fire to dress their victuals."

And further on, at page 31: "To the harbour we gave the name of *Trin*, and the headland which stretched out into the sea, we called '*Capo de Trin*.'"

Mr. Major, in his Introduction, page lxxxv.:—

"When *Sinclair* reached *Greenland* after his adventure off *Iceland*, he entered a harbour, from which *Antonio* says, 'we saw in the distance a great mountain that poured forth smoke.' The harbour they called *Trin*, and whether rightly or wrongly, that is to say, whether so standing in the old map or inserted haphazard by Nicolò Zeno, junior, the promontory of *Trin* is placed at the extreme south point of *Greenland*," &c.

Further: Introduction, page lxxxiv.:

"But the monastery was not only near a lake according to *Ivar Bardsen*, but according to Zeno it was near a hill which vomited

fire like Vesuvius and Etna, and whether it be an extinct volcano or not, there is on the Danish map in a position corresponding with that fixed by Rafn, a hill named 'Suikärssuak.'

As Mr. Major, in his chart accompanying the above Introduction, has laid down the above-mentioned monastery and the hill "Suikärssuak" in Tesserminth-fiord, I spoke with Mr. Steenstrup concerning the Zenonian narrative before he left Copenhagen, when he in 1876 was sent out by the Danish Government on a voyage of discovery to South Greenland. I give here an extract of Mr. Steenstrup's notice thereon, addressed to the Government, concerning his examination of Tesserminth-fiord, by which it comes to light that the hill "*Suikärssuak*" cannot have been either an extinct or any other kind of volcano. "I determined," Mr. Steenstrup says, "in the first half of September to examine a place on the island Sermesok, where it was supposed that Kryolith was to be found, partly in order to examine the ice near Cape Farewell, partly in order to visit Tesserminth-fiord, induced thereto by the comments in a paper published in the 'Journal of the Royal Geographical Society' for 1873, of Mr. Major, to the voyages of Zeno. On the way we visited the hot springs on the island Unartok (before frequently described). Having changed boats at Nennartalik we pushed into the fiord Tesserminth, passing the beautiful rock 'Suikärssuak,' which according to the Zenonian narrative should have been an extinct volcano, *but such is not the case.* Suikärssuak is a mighty granite rock, about 1300 metres high, which by its compactness differs from all the other scattered summits forming the coast of the inner parts of the fiord. '*Suikärssuak*' signifying the '*great, solid, uncloven* (rock).

"Another rock, 'Kuingengek,' opposite to Nennartalik, on the southern side of Tesserminth, might perhaps throw some light on the veracity of the Zenonian 'Carta.' A cape is laid down in the south part of Greenland, and named 'Trin-prom.' and in the text 'Capo di Trin,' which name Mr. Bredsdorff, in his treatise on those voyages, conjectures may be derived from Icelandic 'druni,' Danish 'Tryne'—trunk, snout, proboscis, 'Kuingengek' even signifying a trunk or a snout of a swine, with which the rock seems to have some likeness."

From all these facts we cannot admit that Zeno had been in Greenland, and surveyed and laid down in his 'Carta' the coasts, &c. The tracing of the land is not at all difficult, and it is not to be wondered at that the southland of Greenland is laid 6° too northerly—the position of the greatest part of the lands in his 'Carta' being even more incorrectly laid down than Greenland. But even if he had been there, the examination

and tracing of a coast so extended, exposed to such troubles and hindrances, would have required such a length of time, that we may safely conclude that the charting of Greenland has not been the work of Zeno only and solely. He may have received his knowledge of Greenland from Icelanders, who at that time—300 or 400 years before Zeno—had maintained a lively commerce with Greenland, where many Icelanders had found a home, built churches, &c. From Icelandic tales he also might have learnt that the fishing-boats of the Greenlanders (*"kajaks"*) were made like a "weaver's shuttle."

We may safely assert that volcanoes never existed in South Greenland. Nobody, Zeno excepted, ever mentioned the like; and all his account of fire-vomiting hills on Greenland, and the heating of the monastery and private dwellings by springs of hot water, may refer to Iceland, where volcanoes are found, and hot springs frequently met with, which in many places are used to dress victuals, and could be made use of to a greater extent in heating dwellings, &c. &c.—which probably may have been the case in olden times.

I may remark that in my voyages to Iceland I have twice—in 1826 and 1834—visited Reikholt, the dwelling of the renowned historian Snorre Sturleson, born 1178, and killed by his son-in-law, Gissur Thorvaldsen, 1241, who had built near his seat a basin of great stones for bathing, to which the water was led from a hot-water spring in the neighbourhood; the cold water being led thereto from a brook, that he might give the bath the wished-for temperature. The basin was of such solidity that in 1826 and 1834, after a lapse of about 600 years, I found it as perfect and fit for use (the very spring still existing) as if it had been built up in recent times. I was told that it was scarcely ever made use of; a circumstance which proves that Snorre Sturleson appreciated bathing higher than his successors.

In Reikiadal I have seen small craters, of only a few feet diameter, where the hot water nearly filled the crater to the very brim, used for dressing the victuals; the kitchen-pots being hung between two iron bars over the crater, and sunk in it, the victuals in the pots thus in a short time being heated to the same temperature as the boiling water in the crater. Further, I visited a bathing-place in the neighbourhood of the dwelling of an Icelander, Ión Jonsson, in Reikiadal, contrived by means of various small craters full of hot water—great flat stones making the floor of a hut thatched with turf, like the common Icelandic dwellings. The patients entered the hut where the heated stones produced a great heat—those suffering from the gout placing themselves, enveloped in woollen covers, a longer

or shorter time on the heated floor. As no cold water was to be found in the neighbourhood, the water from the hot springs was led to a basin somewhat distant, where it was cooled.

Coffee cooked with the water had no bad taste whatever, and cattle drinking the water thrived very well.

Zeno had without doubt heard of similar places in Iceland; certainly never in Greenland.

It is to be regretted that the original narrative of Nicolò and Antonio Zeno has not descended to posterity in its integrity as penned by themselves, as it would certainly in that case have been a more precious geographical document than it is in its present state. Zeno the younger, the editor, himself confesses that he, when a child, had torn many of the letters in pieces, and that the 'Carta,' when it was edited, was rotten with age.

VII.—*Zeno's Frislanda is not Iceland, but the Færoes; an Answer to Admiral IRMINGER.* By R. H. MAJOR, F.S.A., Secretary, R.G.S.

It was truly said by the learned John Pinkerton, in his 'History of Scotland' (vol. i. page 261, note), "that Zeno's book is one of the most puzzling in the whole circle of literature." In my edition of that book in 1873 I believed, and still believe, that I had solved all the puzzles therein contained. This belief is based upon the fact that I had demonstrated by the geography of to-day that the Frislanda of the Zeno was the Færoe Islands; and that by the happy discovery of a passage in Torfæus, to the effect that "in the year 1391 the Earl of Orkney slew Malise Sperre (his Norse rival to the earldom) in Shetland with seven others," had been able to correct the date of the map from 1380 to 1390, and, in so doing, to bring the *dramatis personæ* and events described into perfect historical harmony, both as to time and place. Of these two main points the former is the only one to which we are now called upon to direct our attention. I also took great pains to bring into prominent light two stumbling-blocks, over one or other or both of which all my predecessors had tripped, and consequently failed. They are both of them absolutely and unavoidably necessary to be borne in mind if the Zeno book is to be duly criticised, but both one and the other are essentially obnoxious to severely matter-of-fact minds. The first is, the non-recognition of the reality that when proper names are written down

by a foreigner from the lips of natives of whose language and country he is otherwise entirely ignorant, such proper names must be recognised not by their literal rendering, but by their sound, in connection with the circumstances under which they were dictated. So difficult of recognition is this reality by many minds, that I have known persons who have acknowledged the principle in theory stumble at the very first example propounded to them in practice.

The second is the non-recognition of the real or apparent exaggeration—sometimes more apparent than real—almost universally prevailing in narratives of medieval voyages and travels. It is obvious that if the commentator of to-day endeavours to bring down such narratives to the dead level of his own present experiences, making no allowance whatever for the changes which have taken place in the lapse of time, he must either come to wrong conclusions, or else reject the whole story as worthless.

Now it must be confessed that, in finding a remedy for both these difficulties, speculation has to be resorted to, but happily, always within the wholesome check of following the track of the narrative in faithful sequence from a well-recognised beginning to a well-recognised termination. Where this can be done under the light of the historical and geographical knowledge of to-day, we can without hesitation accept the phonetic instead of the literal rendering of the proper names which fall within the track, while we can with equally good conscience, in a proper antiquarian spirit, look back to the habits and style of expression peculiar to the early period under consideration.

Where a subject is so puzzling as that of the Zeno, it is no wonder if propounders of new theories should arise; but if they will not avail themselves of the elucidations I have already given, it is no duty of mine to repeat them. When, however, an honoured veteran like Admiral Irminger propounds a new theory, and adduces *primâ facie* plausible arguments in its favour, I willingly make it a duty to listen respectfully to what he has to advance, and to answer him as clearly as I may.

The phonetic principle Admiral Irminger seems to accept, but he has not, I fear, made due allowance for the changes incident to the lapse of time.

In the Zeno narrative is a description of the formal taking possession, both by land and sea, of Frislanda, which I have shown to be the Færoe Islands, by the chieftain Zichmni, whom I have shown to be Henry Sinclair, Earl of the Orkneys and of Caithness; the taking possession of the *coasts* and *islands* being committed by him to Nicolò Zeno. With reference to this expedition Admiral Irminger makes a long extract from



the Zeno text, including the following passage:—"This fleet of Zichmni sailed to the westwards, and with little trouble gained possession of Ledovo and Ilofe, and other small islands in a gulf called Sudero; where in the harbour of the country, called Sanestol, they found Zichmni, who came *by land with his army*, conquering all the country as he went;" and the admiral's comment is, "As Zichmni *came by land*, Sanestol (Major's Sandoe) must have been continent with the place from which he has come directly." And some lines afterwards he says:—"From whence he came is not said, but *by land it is not possible to come to that little island.*" No one more ready than myself to acknowledge that one does not generally come to an island by land, whether that island be small or great, but it is quite possible to come by land to a bay in an island, though that island be small; and this is all that the text requires, viz. "In the harbour of the country, called Sanestol [*i.e.* the harbour of Sandsbugt], they found Zichmni, who came by land with his army." This explanation, however, does not neutralise Admiral Irminger's formidable statement, that by land it is not possible to come to that little island. I will venture an audacious conjecture. Suppose Earl Sinclair and his men crossed over to Sandoe in boats. Boats have been used for crossing from one island to another before now, while, as Admiral Irminger points out, there was a capital landing-place at Skaapen, on the north side of Sandoe; and, in fact, the Admiral is "perplexed that Zeno was not at the outset directed to this landing-place in order to transport the army to Stromoe for the conquest's sake." Admiral Irminger has not realised that the so-called army—whatever number of men that might mean, probably the merest handful—was with Sinclair himself, while *Zeno had a special task entrusted to him*, which was, that while Earl Sinclair was making his triumphant progress *on land*, he himself was to take formal possession of the *coasts and islands*, for which purpose accordingly he proceeded with *the fleet* to the westwards and northwards.

These and other minor difficulties, to which I shall recur hereafter, force Admiral Irminger to the conclusion that the Frislanda of the Zeno cannot be the Færoe Islands. I will therefore address myself to this principal question at once, in order that a large hole being made for the cat, there may be free passage for the kittens, and so time may be saved. The first fact which confronts us is, that neither Nicolò nor Antonio Zeno, from whom the narrative and map are derived, is of the same opinion as Admiral Irminger; for on the map we find laid down *both* Frislanda and Iceland, and, roughly speaking, for a map made 500 years ago, in their proper positions (sup-

posing Frislanda to be the Færoe Islands), with reference to Greenland, Norway, and Scotland. In order to elevate Frislanda to the dignity of Iceland, Admiral Irminger aims at treating the larger island of Islanda or Iceland as a myth; but this will not do, for on Islanda are laid down the names of the two Icelandic Bishops' Sees, Scalodin and Olensis (the adjectival form of Holum). It is manifest, therefore, that in the opinion of these two ancient Venetian voyagers, the authors of both narrative and map, we have two substantive realities, one Frislanda, the other Iceland, and that Frislanda is not Iceland, and Iceland is not Frislanda. Admiral Irminger is of a different opinion. I beg leave to side with the old voyagers. But it will be said that the Zeno map was sophisticated by Nicolò Zeno, jun., in 1558. True; in his guileless ignorance of the countries referred to, both in map and text, he misread "Eslanda" and "Le Islande," both meaning the Shetland Islands, for Islanda (Iceland), and accordingly endowed the latter island at its east end with a cluster of seven islands, bearing names mentioned in the text as really belonging to the Shetlands. In this we trace a blunder into which he could blamelessly fall, but there is nothing therein to warrant the extravagant supposition that he had evolved from his inner consciousness the island or group of islands named Frislanda, and had not only arbitrarily inserted it on the map, but, knowing no more of the Færoe Islands than the man in the moon, had invented and inserted in the narrative a story of events occurring therein, and agreeing in detail with the geography of the present day. If he could perform such a miracle as this, he would merit canonisation forthwith. But we have no need to resort to the supernatural. The most conclusive evidence that Frislanda and Iceland were transmitted in their entirety by Antonio Zeno, is given in the following words in a letter by him addressed to his brother Carlo. Speaking of a book which he had written, and which, in fact, he brought home with him to Venice, he says, "In it I have described the country, the monstrous fishes, the customs and laws of *Frislanda*, of *Islanda* (Iceland), of *Estlanda* (Shetland), the kingdoms of Norway, *Estotiland*, and *Drogio*."

And now that I have shown on the highest possible authority that Iceland is not Frislanda, nor Frislanda Iceland, I will proceed to show what Frislanda is. If we look at the Zeno map, the first thing which strikes our eye, standing at the extreme south of Frislanda, like a sentinel keeping watch and ward over the group, is the Island of Monaco (Venetian for "Monk"). If we turn to a modern map of the Færoe Islands we see the same monk standing as sentinel in precisely the same

position. For five hundred years and more has that monk stood there patiently on guard, and if he could speak the name of the territory over which he kept ward, that name, whether uttered to-day or five hundred years ago, however the dialect might differ, would virtually be the same. A sturdy and imperturbable sentinel that, whom I venture to think that not even Admiral Irminger will succeed in upsetting. But let us now revert to the already quoted passage from the text, which says (page 6), "Zichmni being anxious to win renown by deeds of arms, had come with his men to attempt the conquest of Frislanda, which is an island somewhat larger than Ireland.\* The fleet under the charge of Zeno, consisting of thirteen vessels, sailed to the westwards, and with little trouble gained possession of Ledovo and Ilofe, and other small islands, in a gulf called Sudero, where in the harbour of the country called Sanestol, they captured some small barks laden with salt fish." Now be it observed that both here in the text, and in the Frislanda of the map, the Gulf of Sudero is mentioned; and if the reader will look at the modern map of the Færoe Islands, he will find between the Island of Sudero, the southernmost of the larger islands of the group, and the Island of Sandoe, the Sanestol of Zeno, Sudero-Fiord, which is the Gulf of Sudero. So that in three independent places we have the Gulf of Sudero, common to the text, the Frislanda of the map, and the Færoe Islands of the map of to-day. The identity is then unavoidable.

From Sandsbugt, in Sandoe, where Sinclair met Zeno, the text says that the fleet, making its course still westwards, came to the other cape of the gulf, and then turning again they fell in with certain islands and lands which they brought into possession of Zichmni. This sea was in a manner full of shoals and rocks, so that had Messire Nicolò and the Venetian mariners not been their pilots, the whole fleet would have been lost. By the advice of Messire Nicolò, the captain now determined to go ashore, at a place called Bondendon, and there they heard that Zichmni had put to flight the army of the enemy; in consequence of which ambassadors were sent from all parts of the island to yield the country up into his hands. Here they awaited his arrival, when Zichmni having complimented Messire

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\* Had Admiral Irminger done me the honour to read a note which I made on this passage in my book, he need not have insisted on this evidently blundering use of the word "Ireland" by Nicolò Zeno, junr. The note runs thus:—"From the Zeni's utter ignorance of Ireland, as shown in a subsequent part of the narrative, I have reason to suspect that the word rendered here 'Irlanda' was in the original text 'Islanda or Eslanda,' as written elsewhere in the text for 'Shetland.' The proportions of Frislanda and Estland (*i.e.* Shetland) on the Zeno map, are in accordance with this conclusion."

Nicolò on his great zeal and skill, conferred on him the honour of knighthood, and rewarded his men with very handsome presents. "Departing thence," the text goes on to say, "they went in triumphant manner towards Frislanda, the chief city of that island on the south-east of it, lying inside a bay, in which there is such great abundance of fish, that many ships are laden therewith to supply Flanders, Brittany, England, Scotland, Norway, and Denmark, and by this trade they gather great wealth."\*

A glance at the map of the *Færoe* Islands will show how accurately this track of the fleet accords with the localities, and if at the same time the *Frislanda* of the *Zeno* map be consulted, it will be seen that Bondendon lies opposite to the town of *Frislanda*, the capital of the whole group, *i.e.* *Thorshavn*,† while on the modern map, *Norderdahl*, on the west side of the island of *Stromoe*, of which *Bondendon* is the phonetic representative,‡ occupies the same position opposite *Thorshavn*, on the south-east of *Stromoe*, as the text describes.

In the course of this track there are two points to which Admiral *Irminger* raises objections. One is, that there are rocks but no shoals, where *Zeno* described the latter to be, but the expression occurs in a passage where there is much vaunting of the nautical skill of the Venetian mariners, and whether there are shoals there or not, rocks and shoals are not infrequent companions, and we must not be surprised at vanity exhibiting itself in a little braggadocio. Admiral *Irminger's* second objection is, "That there is no anchor ground at *Norderdahl*, but often a strong current and heaving of the sea." "The beach," he says, "in its whole length from *Norderdahl* to the southernmost part of *Stromoe* is a somewhat steep-to and rocky coast." Perhaps on this occasion there was no strong current or heaving of the sea, and, as there was a beach, we may reasonably suppose that *Sinclair* was able to communicate with *Zeno*, as the text describes, before his triumphant departure for *Thorshavn*, *alias* *Frislanda*.

While thus treating of the coasts and rocks in this part of the *Færoe* group, it is well that I should advert to another occasion, much later in the narrative, when great preparations were being made for an extensive voyage to the west, to a country called *Estotiland*. "Steering westwards," says *Antonio*

\* In this sentence there is unquestionably much apparent exaggeration.

† In medieval times it was a frequent custom to apply the name of the whole country to the capital.

‡ I observe that Admiral *Irminger* speaks of *Bondendon* as "Mr. Major's and Admiral *Zahrtmann's* *Norderdahl*;" and of *Sanestol* as "Major's and *Zahrtmann's* *Sandoe*." I find no trace whatever of Admiral *Zahrtmann* having made these identifications. I alone am responsible for them.

Zeno, "we discovered some islands subject to Frislanda, and, passing certain shoals, came to Ledovo, where we stayed seven days to refresh ourselves, and to furnish the fleet with necessities. Departing hence, we arrived on the 1st of July at the island of Ilofe." The reader will recollect the mention of these islands in the Gulf of Sudero in Nicolò Zeno's expedition. In the modern map of the Færoe Islands will be seen in Sudero Gulf the islands of Lille Dimon, Store Dimon, and Skuoe. It is not difficult to understand how Zeno, hearing Lille Dimon uttered by a northerner, should give to the sound that he heard the form of Ledovo, and it has been suggested by Bredsdorff, in his article on the Zeno voyages in 'Grönland's Historiske Mindesmærker,' that the "I" in Ilofe has been mistakenly written by Nicolò Zeno, jun., for an "S," and thus we may see that Skuoe easily becomes, when written down by the southerner, Slofe. We will now see what Admiral Irminger says with respect to Lille Dimon, apropos of the above quotation from Antonio Zeno—"Let us examine," he says, "that island 'Little Dimon,' of which I subjoin a sketch. Little Dimon rises steep out of the almost constant heavy seas of the North Atlantic, is 1299 feet high, its greatest diameter at the level of the sea about half a mile. No port, no anchorage, no leese side; almost always breakers more or less against that almost perpendicular rocky coast; very often, through the strong tide, races whirling round the island, increasing in violence. The island is abordable only at one single point, and this only in calm weather; it is, besides, so steep to that one ought to be accustomed to climb almost perpendicular rocks to get ashore, and no fresh water is to be found. *Certainly the fleet stayed not here at this uninhabitable spot for refreshment and necessities, where nothing is found but rock and a little grass.*" I sincerely sympathise with Admiral Irminger in his view of the inhospitable nature of this well-proportioned and elevated rock. Small prospect there of a comfortable turn-in over night, and a dressing-gown and slippers and hot water in the morning, and yet I think Antonio Zeno was quite right after all. He says nothing about going on the rock, but as the fleet were bound for a far distant land in the west, it was absolutely necessary to take in ample provision of fish, and *off* that island they may well have spent seven days in catching or procuring the needful supplies. But to sum up—whatever may be Admiral Irminger's opinions respecting the adaptability of the Zeno narrative of events to the Færoe Islands, the inexorable, unavoidable fact will still remain, that the names of Monaco, Sudero Golfo, Streame (evidently Stromoe), and Andeford (evidently Andafer), are given on the Frislanda of the Zeno map, and that they, and all the

names relating to Frislanda, mentioned in the text, correspond in position with the geography of the Færoe Islands of to-day. So that it would be perverseness to deny the identity of the two.

And now let us see what is the result of leaving that which is real, to indulge in that which is fanciful. Admiral Irminger has of his own arbitrary choice elected to adopt Iceland as the representative of the Frislanda of the Zeni. In order to carry out his plan, he has been compelled to seek out spots in that island upon which he can foist the names applied by the Zeni to localities in the Færoe Islands. He finds no Monaco or Monk. He invents one. He finds no Gulf of Sudero. He invents one. He finds no Sanestol. He invents three queried ones, the two widest apart being some 50 miles distant from each other. It is true he finds a beautiful phonetic representative of Bondendon in "Budardalr"; but unfortunately not one of all these fits in with the requirements of the text. For example, he selects two gulfs on the west coast of Iceland, named respectively Brede Bugt and Faxø Bugt, and as the latter lies south of the former, he arbitrarily gives it the name of Sudero Golfo, and what is the consequence? The description of Nicolò Zeno's expedition, which tallied exactly with the modern map of the Færoe Islands, here breaks down altogether. Admiral Irminger's Sudero Golfo merely means Southern Gulf as distinguished from its northern neighbour; but the Gulf of Sudero of the text means the Gulf of the Southern Island, taking its name from the actual island of Suderoe in the Færoe Isles, the Gulf or Fiord of Suderoe lying between it and Sandøe, Zeno's Sanestol. The text says that "Zichmni's fleet sailed to the *westwards*, and with little trouble gained possession of Ledovo and other small islands in the Gulf of Sudero." Now I respectfully challenge Admiral Irminger to say whether he by a westward course *could* sail into his Sudero Golfo on the west coast of Iceland; and I would ask, where are the islands of Ledovo and Ilofe in said gulf? Simply nowhere. But, to be brief, we will suppose Zeno to have finally reached Admiral Irminger's Bondendon. We find that its position by no means tallies with that of the Bondendon in the Zeno map, whereas that of Norderdahl on the island of Stromøe exactly does, and then what follows? After the meeting of Zichmni and Nicolò Zeno, the former, with his followers, "departing thence went in triumphant manner towards Frislanda, the chief city of that island, on the south-east of it." Frislanda, *i.e.* the capital of the whole country, *i.e.* Thorshavn, does lie on the south-east of the island of Stromøe; but I would respectfully ask Admiral Irminger whether the chief city of Iceland lies on the south-east of that island? I had always

thought it lay on the south-west. I could comment on Porlanda, which, on page 5 of the Zeno text, is shown to lie near to Scotland, and without doubt represents the Orkneys, while Admiral Irminger transports them to 200 miles' distance, but I think I have already said enough on this subject.

Admiral Irminger has reasoned entirely from the data of to-day. His honest northern nature and his native common sense would revolt from the application to such small islands as those which compose the Færoe group, of such expressions as that "after Zichmni had put to flight the army of the enemy, ambassadors were sent from all parts of the island to yield the country up into his hands, taking down their ensigns in every town and village." And yet this apparent exaggeration may be more apparent than real. It must be remembered that this was 500 years ago. A so-called army then might be but a mere handful of men. "Tempora mutantur, nos et mutamur in illis." Moreover, it was no unimportant event which was taking place. Henry Sinclair, Earl of the Orkneys and Caithness, was taking personal possession of the Færoe Islands as an addition to his lordships, and when we read of his coming *by land* with his army, conquering all the country as he went, it is obvious that the chieftain's progress *by land* is there indicated as distinct from the taking possession of the *coasts and islands*, which was committed to the charge of Nicolò Zeno. It cannot be supposed that all this was done without a certain amount of formal ceremony, warranting in a considerable degree the apparently inflated language above quoted.

But Admiral Irminger has not confined himself to the endeavour to identify the Frislanda of the Zeno with Iceland. He denies that Zeno was ever in Greenland or the Engroneland of the text, which country he also endeavours to identify with his favourite northern island of Iceland. This is not the place to enter again upon the whole story. Suffice it that, as in the case of Frislanda, both the text and map distinctly bear their testimony to his visit having been made to Engroneland, or Greenland, while it is needless to say that Iceland, in both one and the other, has its own individual and separate existence, so that Admiral Irminger again places himself in opposition to the very authors of the narrative and of the map. By them it is plainly shown that they distinctly recognise the existence of two substantive realities, one Engroneland or Greenland, the other Iceland; and that, in their opinion, Engroneland is not Iceland; nor Iceland, Engroneland. Admiral Irminger is of a different opinion. Again I beg leave to side with the old voyagers.

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VIII.—*Approximate Determination of Positions in South-Western China.* By G. COLBORNE BABER.

[Communicated by the Foreign Office.]

WITH the exception of the points established by Captain Blakiston and Lieutenant Garnier, our knowledge of the geographical position of places in Western China rests entirely upon the authority of the Jesuit surveyors, whose results, laid down partly from observation with inefficient instruments, and partly from the collation of native information, are necessarily erroneous in many details, and are never exact. Their observations for latitude often deviate from the truth by so much as 6 or 7 miles, and their longitudes, even as re-arranged by modern geographers, are probably vitiated by a still greater error. Nevertheless their map is for general purposes a most admirable work, and since it was never designed to serve as a route-map for tourists, or a chart for river-pilots, it would be ungracious to find fault with its deficiencies; especially when it is remembered that all existing maps of Eastern Asia are more or less modified reproductions of their survey.

Modern explorers are, however, fair game, and it is at once the duty and the delight of a traveller to search out the defects of his predecessors. But, with the best will in the world, I cannot establish any charge against Captain Blakiston. A severe test of his work is to observe the latitude of places the position of which he had obtained by dead reckoning only, and over a long distance; tried in this way he is always practically exact. But I have applied the still more searching criterium of longitude by chronometer. His lunar observations, as adopted by Mr. Arrowsmith, give  $1^{\circ} 55'$  (one degree fifty-five minutes) for the difference of longitude between Sü chow and Chung ching. Selecting a season when a quick run could be made, I carried a chronometer down from Sü chow, and obtained a difference of  $1^{\circ} 59'$  (one degree fifty-nine minutes); a most satisfactory agreement. Captain Blakiston's lunar observations seemed to have gained in trustworthiness as he travelled farther west, and at Sü chow his results east and west of the moon are very close together. There seems every reason for assuming that his absolute longitude of Sü chow is as near the truth as lunar series will admit of.

But then comes Lieutenant Garnier and shocks the complacent feeling of finality by removing the position twenty-six minutes westwards. The discrepancy is, after all, not very serious, as sextant observations go; but still it is disagreeable, and I have devoted a good deal of time and labour to its



examination. The first place in which, after much wandering and waiting, I at last found an almost unexceptionable opportunity for obtaining lunar series, was Tzū-ta-ti, the headquarters of a Sifan chief, in lat.  $29^{\circ} 16' 45''$ , and a few days later another good opportunity occurred at the village of Na-erh-pa, 8 miles to the eastward. The two results, as may be seen by the record of observations hereto appended, agree exceedingly well, and place the mouth of the Lao-wa torrent, which lies half-way between the stations, in long.  $102^{\circ} 41'$ . Extending this result by careful dead reckoning to Chia-ting-fu, and thence by chronometer to Sū chow, I came almost exactly upon the point laid down by Captain Blakiston: the four walls of the city would have nearly included both determinations. It seems, therefore, safe to prefer Captain Blakiston's position to that adopted by Lieutenant Garnier, and to suppose that it is very slightly in error.

The position of the more southern portions of my chart, as regards longitude, rests upon the accuracy of dead reckoning corrected by frequent observations for latitude and variation of compass. In this way, on reducing the route-chart which I kept when travelling with Mr. Grosvenor, Yünnan Fu falls upon  $102^{\circ} 41'$  (oddly enough the longitude of the Lao-wa river mouth determined as above), differing by four or five minutes only from Lieutenant Garnier's result. Again, if my chart of the mission-route from Yünnan Fu to T'êng-yüeh (Momein) be examined, it will be seen that the difference of longitude between those points, according to the dead reckoning, is  $4^{\circ} 17'$  (four degrees seventeen minutes), which, if the position of T'êng-yüeh according to the Sladen mission, viz.  $98^{\circ} 26'$ , be accepted, would place Yünnan Fu in  $102^{\circ} 43'$ , practically the situation in which I found it.

I put Tali Fu, by the same process, in long.  $100^{\circ} 3'$ , some twenty-five minutes west of Lieutenant Garnier's acceptance. But his position also depends upon dead reckoning alone; and since my account of the distance between Yünnan Fu and T'êng-yüeh, taking Tali Fu *en route*, seems correct enough, I submit that probabilities are strongly in my favour.

Accepting Blakiston's determination for Sū chow Fu, Garnier's for Yünnan Fu, and the received position of T'êng-yüeh, all my route-work falls comfortably into place without straining or distortion.

I may add that I obtained a lunar series of poor value at Ch'iao-chia Ting (B.), but I prefer to depend upon dead reckoning for the position. The record marked (D.) is the history of a failure, and I only append it for the sake of fairness. As far as the *observation* is concerned, it was the best

and most deliberate of my lunar series; its want of success may be attributed to two causes: the Eastern Star was the most ineligible, with one exception, of the whole year's category, and the hill-forest below it was on fire.

The record of latitudes needs no comment except in one particular, viz. the rather serious difference from the positions adopted by Lieutenant Garnier between Sü chow and Tung-ch'uan. I do not know if his results for that section rest upon sextant observations. It may be objected that my latitudes in that part of the route depend upon altitudes taken only upon one side of the zenith, but this stricture will not apply to the station of Chiang-ti, where the discrepancy is equally apparent. At Tung-ch'uan and farther south the agreement is satisfactory. For the position of Tali Fu Mr. Garnier appears to have accepted the Jesuits' latitude; indeed, as he had barely time to escape from personal danger in that neighbourhood, it is not to be supposed that he could have devoted much attention to sextant manipulation.

It will be seen that my latitude observations from No. 48 downwards exhibit a considerable intrinsic sextant error, apart and distinct of course from index error; but, being constant, it was of no importance whatever, and I thought it well to refrain from "tormenting the instrument."

The observations for compass variation (Table G.) were all made by sun's altitude and azimuth, no sunset or sunrise sights being anywhere obtainable.

In Table (H.) I have compared my deduced positions of the most important points with the determinations of the Jesuits and of Mr. Garnier. The latter have been measured from his general map, and are therefore somewhat loose.

E. COLBORNE BABER.

*Chung-ching, 25th July, 1879.*

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## APPENDIX.

## (A.) OBSERVATIONS for LATITUDE.

STATION.	Position of Object observed N. or S. of Zenith.	Result.	Mean, or accepted, Lat.	REMARKS.
1. P'ing-shan Hsien (River bank at east end of City).	Star N. ( $\alpha$ Urs. Ma.)	28 39 6	28 39 8	Fair.
2. Ditto .. ..	Sun	28 39 10		Good.
3. Yen-tzu-ngai ..	Sun	28 24 0	28 24 0	Good.
4. T'an-t'ou .. ..	Star S. (Sirius)	28 19 50	28 19 50	Very good.
5. Lin-chiang-ch'i ..	Sun	28 9 23	28 9 23	Good.
6. Top of Li-shan ..	Sun	28 3 21	28 3 21	Fair.
7. Ta-ngai-tung ..	Sun	27 31 29	27 31 29	Fair.
8. Cha-shang .. ..	Sun	27 25 23	27 25 20	Good.
9. Chao-t'ung Fu .. (Examination Hall).	Star S. (Sirius)	27 20 42		Fair.
10. Ditto .. ..	Sun	27 20 29		Fair.
11. Ditto .. ..	Star S. (Rigel)	27 20 41	27 20 35	Good.
12. Ditto .. ..	Star S. (15 Argus)	27 20 49		Very doubtful.
13. Ditto .. ..	Sun	27 20 43		Very good.
14. Cha-la-hsün ..	Sun	27 16 31	27 16 25	Fair.
15. Chiang-ti .. ..	Star S. (Rigel)	27 0 0		Satisfactory.
16. Ditto .. ..	Star N. ( $\alpha$ Urs. Ma.)	26 59 40	26 59 50	Satisfactory.
17. Ya-k'ou-t'ang ..	Sun	26 54 52	26 54 45	Good.
18. I-chê-hsün .. ..	Star S. (Sirius)	26 49 30	26 49 25	Satisfactory.
19. Shan-hu-shu ..	Sun	26 42 48	26 42 45	Good.
20. Hung-shih-ngai ..	Star S. (Sirius)	26 37 38	26 37 35	Fair.
21. Tung-ch'uan Fu .. (Examination Hall).	Star S. (Sirius)	26 25 0	26 25 0	Fair.
22. Hsiao-chang-t'ang	Sun	26 19 50	26 19 45	Fair.
23. Chê-chi .. ..	Star S. (Sirius)	26 14 37		Fair.
24. Ditto .. ..	Star N. ( $\alpha$ Urs. Ma.)	26 14 20	26 14 30	Fair.
25. Lai-t'ou-p'o .. ..	Star S. (Sirius)	26 1 42		Not very good.
26. Ditto .. ..	Star N. ( $\alpha$ Urs. Ma.)	26 1 39	26 1 40	Good.
27. Ditto .. ..	Sun	26 1 81?		Good.
28. Ditto .. ..	Star S. (Sirius)	26 1 37		Good.
29. Kung-shan .. ..	Star S. (Sirius)	25 45 7		Fair.
30. Ditto .. ..	Star N. ( $\alpha$ Urs. Ma.)	25 44 49	25 45 0	Fair.
31. Liu-shu-ho .. ..	Sun	25 40 10	25 40 0	Fair.

## (A.) OBSERVATIONS for LATITUDE—continued.

STATION.	Position of Object observed N. or S. of Zenith.	Result.	Mean, or accepted, Lat.	REMARKS.
32. Hsün-tien-chou ..	Star S. (Sirius)	25 34 6	25 33 50	Fair.
33. Ditto .. ..	Star N. (α Urs. Ma.)	25 33 34	25 33 50	Fair.
34. I-lung .. ..	Star S. (α Hydræ)	25 23 26	25 22 20	Very rough.
35. Ditto .. ..	Star N. (α Urs. Ma.)	25 22 9	25 22 20	Good.
36. Ho-k'ou .. ..	Sun	25 17 10	25 17 0	Good.
37. Yang-lin .. ..	Star S. (Sirius)	25 13 36	25 13 27	Good.
38. Ditto .. ..	Star N. (α Urs. Ma.)	25 13 18	25 13 27	Good.
39. Ch'ang-p'o .. ..	Star S. (Sirius)	25 7 46	25 7 45	Good.
40. Ditto .. ..	Star N. (α Urs. Ma.)	25 7 43	25 7 45	Good.
41. Fên-shui-ling ..	Sun	25 5 24	25 5 24	Fair.
42. Pan-ch'iao .. ..	Star S. (Sirius)	25 3 6	25 3 12	Fair.
43. Ditto .. ..	Star N. (α Urs. Ma.)	25 3 18	25 3 12	Satisfactory.
44. Yün-nan Fu ..	Star S. (Sirius)	25 2 41	25 2 40	Good.
45. Ditto .. ..	Star N. (α Urs. Ma.)	25 2 35	25 2 40	Fair.
46. Ditto .. ..	Star S. (Sirius)	25 2 45	25 2 40	Good.
47. Ditto .. ..	Star N. (α Urs. Ma.)	25 2 55	25 2 40	Fair.
48. Liao-i-p'u .. ..	Jup.	28 54 35	28 54 0	Fair.
49. Pao-an-ying .. ..	Do.	28 49 53	28 49 25	Fair.
50. Têng-hsiang .. ..	Do.	28 28 22	28 27 45	Good.
51. Ning-yuan Fu .. (Examination Hall).	Do.	27 54 14	27 53 30	Good.
52. Ditto .. ..	Do.	27 54 3	27 53 30	Good.
53. Ditto .. ..	Star N. (α Cephei)	27 52 41	27 53 30	A little before meridian: fair.
54. Huang-lien-p'u ..	Jup.	27 41 19	27 40 45	Good.
55. Ditto .. ..	Star N. (α Cephei)	27 40 10	27 40 45	Good.
56. Ma-li-chai .. ..	Jup.	27 32 8	27 31 35	Good.
57. Hsiao-kao-ch'iao	Do.	27 22 14	27 21 40	Satisfactory.
58. Chin-ch'üan-ch'iao	Sun	27 11 32	27 11 0	Good.
59. HUI-LI-CROW ..	Do.	26 39 35	26 39 0	Rough.
60. Ditto .. ..	Do.	26 39 35	26 39 0	Good.
61. Hsiao-pa .. ..	Do.	26 34 10	26 33 40	Very good.
(1/3 mile N.W. of).				
62. Ditto .. ..	Do.	26 34 23	26 33 40	Very good.
(Same Station).				
63. Liu-shu-wan ..	Do.	26 35 56	26 35 20	Fair.

(A.) OBSERVATIONS for LATITUDE—*continued.*

STATION.	Position of Object observed N. or S. of Zenith.	Result.	Mean, or accepted, Lat.	REMARKS.
64. Ch'è-la .. .. (2 miles N.E. by E. of).	Sun	26 38 57	26 28 30	Good.
65. Wa-wu .. ..	Do.	26 53 47	26 53 10	Rough.
66. Ch'iao-chia T'ing	Star N. (α Cephei)	26 54 14	26 54 50	Fair.
67. Ditto .. ..	Mars	26 55 29		Fair.
68. Ai-chuo .. ..	Star N. (α Cephei)	26 55 5	26 55 45	Fair.
69. Ditto .. ..	Mars	26 56 32		Fair.
70. Ditto .. ..	Sun	26 56 6	26 58 20	Good.
71. Mao-p'o .. ..	Star N. (α Cephei)	26 57 55		Fair.
72. Niu-ko-ch'ang ..	Sun	27 2 58	27 2 20	A little late.
73. Lung-shu .. .. (1 mile S. of).	Do.	27 18 27	27 18 0	Rough.
74. Pai-fa-ch'i .. ..	Do.	27 33 2	27 32 25	Fair.
75. San-chia-chai ..	Do.	27 39 27	27 39 0	Fair.
76. Miao-wa .. .. (1 mile E.N.E. of).	Do.	27 50 0	..	Not worth much.
77. Yang-liu-shu ..	Do.	27 50 48	27 50 10	Fair.
78. Huang-p'ing ..	Star N. (α Cephei)	27 52 0	27 52 40	Good.
79. Ditto .. ..	Mars	27 53 23		Fair.
80. Sha-ho .. ..	Sun	27 57 22	27 56 40	Good.
81. Kan-t'ien-pa ..	Star N. (α Cephei)	27 57 16	27 58 0	Poor.
82. Ditto .. ..	Mars	27 58 40		Good.
83. Huang-kuo-shu .. (South end).	Sun	28 0 2	27 59 25	Good.
84. Ya-k'ou .. ..	Star N. (α Cephei)	28 0 26	28 1 0	Fair.
85. Ditto .. ..	Mars	28 1 35		Fair.
86. Ditto .. ..	Sun	28 2 10	28 4 45	Not worth much : bystanders troublesome.
87. Ting-chiang-ao ..	Do.	28 5 20		Good.
88. Yu-fang-kou .. (Farm house).	Do.	28 13 26	28 12 50	Good.
89. Ching-ti .. ..	Star N. (α Cephei)	28 13 42	28 14 15	Fair.
90. Ditto .. ..	Mars	28 14 51		Fair, but hurried.
91. Bluff E. of Ching-ti	Sun	28 15 5	28 14 30	Good.
92. Kuo-ch'üan-t'an ..	Mars	28 13 29	28 13 0	Very good.
93. Hsin-tien-tzu ..	Sun	28 14 51	28 14 15	Good.
94. Huang-lung-ch'i ..	Do.	28 35 30	28 35 0	Fair.
95. 1½ miles W. of Ming-yuan Bridge.	Do.	28 38 38	28 38 0	Fair.
96. Sü-chou Fu .. (N. corner of).	Do.	28 47 23	28 46 50	Good.
97. 2 miles above Niu- shih-pien. (See Chart).	Do.	28 48 11	28 47 35	Satisfactory.

(A.) OBSERVATIONS for LATITUDE—*continued*.

STATION.	Position of Object observed N. or S. of Zenith.	Result.	Mean, or accepted, Lat.	REMARKS.
98. Ni-ch'i-chang .. (Upper end).	Sun	29° 1' 15"	29° 0' 40"	Fair, result doubtful.
99. Chu-kên-t'an .. ( $\frac{1}{2}$ mile above centre).	Do.	29 25 31	29 24 55	Fair.
100. Tung River .. (Mouth of, R.B.).	Do.	29 34 4	29 33 30	Fair.
101. Chia-ting Fu .. (Middle of E. wall).	Do.	29 34 40	29 34 5	Very rough.
102. Lu-lu-p'ing ..	Do.	29 18 45	29 18 10	Fair.
103. Ta-t'ien-ch'ih ..	Do.	29 24 0	29 23 25	Fair.
104. Mu-hsü ..	Do.	29 21 18	29 20 45	Satisfactory.
105. Fu-lin ..	Do.	29 21 46	29 21 10	Good.
106. Ho-chiang-pa ..	Do.	29 21 29	29 20 55	Good.
107. Lao-wa-hsüan .. (1 mile W.S.W.).	Do.	29 16 0	?	Unsatisfactory.
108. Tzu-ta-ti ..	Do.	29 17 35	29 16 45	Very good.
109. Ditto ..	Star S. (Sirius)	29 17 27		Good.
110. Ditto ..	Star N. ( $\alpha$ Urs. Ma.)	29 16 0	29 14 50	Very good.
111. Lao-wa-hsüan ..	Sun	29 15 38		Good.
112. Na-erh-pa ..	Do.	29 16 22	29 15 25	Poor.
113. Ditto ..	Star N. ( $\alpha$ Urs. Ma.)	29 14 37		Good.
114. Ditto ..	Star S. (Spica)	29 16 14	29 15 25	Fair.
115. Ditto ..	Star N. ( $\alpha$ Urs. Ma.)	29 14 38		Fair.
116. Ditto ..	Star S. (Spica)	29 16 13	29 20 20	Good.
117. Ch'u-la ravine .. ( $\frac{3}{4}$ mile S. of mouth).	Star N. ( $\alpha$ Urs. Ma.)	29 19 50		Fair.
118. Ditto ..	Star S. (Spica)	29 20 53	29 32 5	Good.
119. Wan-tung ..	Sun	29 32 37		Fair, but sun too high to be trustworthy.
120. Ta-chien-lu .. (Near S. Gate).	Star N. ( $\gamma$ Urs. Ma.)	30 2 40	30 3 6	Good.
121. Ditto ..	Star N. ( $\gamma$ Urs. Ma.)	30 2 25		Poor.
122. Ditto ..	Star S. (Antares)	30 3 49	29 54 55	Fair.
123. Ditto ..	Star S. (Spica)	30 3 28		Good.
124. Lu-ting-ch'iao ..	Star N. ( $\gamma$ Urs. Ma.)	29 54 27	29 54 55	Good.
125. Ditto ..	Star S. ( $\gamma$ Virg.)	29 55 8		Fair.
126. Ditto ..	Star S. (Spica)	29 55 24	29 32 55	Good.
127. Ditto ..	Star N. ( $\gamma$ Urs. Ma.)	29 54 43		Good.
128. Fu-chuang .. (S.E. end).	Star S. (Spica)	29 33 23	29 32 55	Fair.

## OBSERVATIONS FOR LONGITUDE.

(B.)

Ch'iao-chia T'ing, 18 Sept. 1877. Obs. for Longitude, in N. lat.  $26^{\circ} 54' 52''$ , with Sextant C.Adjusted slight side error. Observed Index error,  $25'' +$ . Observed Barometer 27.11, and Thermometer  $71^{\circ}$ .

Time obs. Star W.			Time obs. Star E.		
Watch.			Watch.		
Double Alts. Jupiter.			Double Alts. Mars.		
H.	M.	S.	H.	M.	S.
8	19	15	8	26	40
8	21	40	8	28	15
8	23	35	8	29	25

## LUNAR DISTANCES.

Watch.			Watch.		
Dist. Jupiter fr. N.L.			Dist. Mars fr. F.L.		
H.	M.	S.	H.	M.	S.
8	34	20	8	55	2
8	37	55	8	58	35
8	40	10	9	0	40
8	44	15	9	3	25
8	47	3	9	5	20

## Time obs. Star E.

Watch.			Double Alts. Mars.		
H.	M.	S.	°	'	"
9	16	55	81	50	10
9	18	23	82	15	40
9	19	48	82	39	20

## Time obs. Star E.

Watch.			Double Alts. $\beta$ Ceti.		
H.	M.	S.	°	'	"
*11	25	46	78	28	20
11	27	3	78	57	0
11	28	38	79	16	20

## LUNAR DISTANCES.

Watch.			Dist. Saturn fr. F.L.		
H.	M.	S.	°	'	"
11	34	11	34	20	20
11	39	5	34	18	30
11	41	10	34	17	50
11	45	2	34	16	30
11	47	26	34	15	50

## Time obs. Star E.

Watch.			Double Alts. $\beta$ Ceti.		
H.	M.	S.	°	'	"
11	52	32	83	38	50
11	54	13	83	54	20
11	55	42	84	8	20

## Time obs. Star W.

Watch.			Double Alts. Mars.		
H.	M.	S.	°	'	"
12	56	43	86	32	50
12	58	16	86	10	0
13	0	6	85	42	10
13	1	3	85	26	10
13	2	1	85	10	40

RESULTS: By Jupiter .. ..  $103^{\circ} 3.5'$   
 ,, By Saturn .. ..  $102^{\circ} 39'$

$102^{\circ} 51'$  E. long.

\* This should be 11 h. 24 m. 46 s.

(C.)

Tzū-ta-ti, A.M. \*24th March, 1878, in N. lat.  $29^{\circ} 16' 44''$ . Observed with Sextant B.

Time obs. Star W.				Time obs. Star E.			
Watch.			Double Alts. Regulus.	Watch.			Double Alts. Vega.
H.	M.	S.	° ' "	H.	M.	S.	° ' "
1	38	46	73 15 30	1	48	52	64 44 10
1	40	5	72 41 40	1	50	13	65 14 10
1	41	7	72 14 20	1	51	15	65 38 30
1	42	10	71 47 20	1	52	27	66 5 30
1	43	18	71 18 10	1	53	29	66 29 20

LUNAR DISTANCES.

Watch.				Watch.			
Dist. Spica fr. F.L.				Dist. Jupiter fr. N.L.			
H.	M.	S.	° ' "	H.	M.	S.	° ' "
2	23	30	48 52 20 — 3 A.M.	4	0	10	50 7 0
2	26	40	48 52 50 — Ther. $58^{\circ}$ .	4	2	26	50 6 10
2	27	58	48 53 10 — Bar. $26.98$ .	4	4	34	50 5 40
2	35	33	48 55 50 — L.E. $1' 50''$ .	4	6	15	50 5 10
2	38	24	48 57 30 — $1' 30''$ .	4	7	57	50 4 30
2	41	51	48 58 50 — $1' 50''$ .	4	10	4	50 3 50
2	45	50	49 0 20 — $1' 30''$ .	4	12	33	50 3 10

Time obs. Star E.				Time obs. Star W.			
Watch.			Double Alts. Altair.	Watch.			Double Alts. Spica.
H.	M.	S.	° ' "	H.	M.	S.	° ' "
4	20	16	77 3 40	4	30	27	57 1 40
4	21	28	77 35 30	4	31	55	56 29 10
4	24	3	78 41 0	4	33	0	56 5 20
4	25	11	79 10 0	4	34	1	55 43 10
4	26	11	79 35 20	4	35	27	55 11 50

NOTE.—Subtract four seconds from all times.

RESULT: By Spica .. ..  $102^{\circ} 39.5$   
 ,, By Jupiter .. ..  $102^{\circ} 39.3$

$102^{\circ} 39.4$  E. long.

(D.)

Tsū-ta-ti, A.M. 25th March, 1878, in N. lat.  $29^{\circ} 16' 44''$ . Sextant B.  
 1.30 A.M. Ther.  $67^{\circ}$ . Bar.  $26.76$ .

Index Error .. ..  $1' 20''$   
 ,, .. ..  $1' 40''$   
 ,, .. ..  $1' 20''$   
 ,, .. ..  $1' 20''$   
 ,, .. ..  $1' 40''$

Time obs. Star W.				Time obs. Star E.			
Watch.			Double Alts. Regulus.	Watch.			Double Alts. Vega.
H.	M.	S.	° ' "	H.	M.	S.	° ' "
1	51	31	65 28 0	2	2	12	71 47 10
0	52	55	64 50 0	0	3	39	72 20 40
0	54	27	64 10 10	0	4	54	72 50 40
0	56	10	63 25 10	0	6	11	73 19 50
0	57	20	62 54 20	0	7	40	73 55 10



## LUNAR DISTANCES.

Watch. Dist. Spica fr. F.L.

H.	M.	S.	°	'	"
2	15	25	62	6	50
0	18	39	62	7	30
0	21	44	62	8	10
2	50	12	62	20	10
0	54	0	0	21	30
0	57	55	0	22	30
3	12	53	62	29	20
0	15	20	0	30	10
0	18	36	0	31	0

Watch. Dist. Altair fr. N.L.

H.	M.	S.	°	'	"
2	33	24	48	23	0
0	36	13	48	22	0
0	40	53	48	21	20
3	2	4	48	17	10
0	4	17	0	16	20
0	8	49	0	14	20
3	22	15	48	12	40
0	28	42	0	10	50
0	30	37	0	10	30

Time obs. Star E.

Watch.			Double Alts. Altair.		
H.	M.	S.	°	'	"
3	47	39	65	20	20
0	48	45	65	47	40
0	50	30	66	33	10
0	51	37	67	0	5(?)
0	52	57	67	36	0

Time obs. Star W.

Watch.			Double Alts. Spica.		
H.	M.	S.	°	'	"
3	59	40	66	8	50
4	0	59	65	41	20
4	2	10	65	16	50
4	3	23	64	50	20
4	4	33	64	26	40

Index Error .. 1 30 — Bar. 26.77. Ther. 64°.

1 50  
1 20  
1 30  
1 30  
1 30  
1 30  
1 30

NOTE.—Subtract four seconds from all times.

RESULTS: By Spica:

By Altair:

°	'	"	E.	°	'	"
102	32	30	E.	101	23	15
102	24	45		101	31	0
102	25	30		101	44	45

Rejected.

(E.)

Na-erh-pa, 7th April, 1878. Obs. for Longitude, in N. lat. 29° 15' 25".  
NOTE.—Subtract four seconds from (1) and (3), not from (2).  
Observed with Sextant C.

Time obs. by ☉.

Watch.			Double Alts. ☉		
H.	M.	S.	°	'	"
2	2	59.5	105	32	40
	4	7	105	8	40
	5	7	104	46	30
	6	12	104	22	50
	7	6	104	1	0

DISTANCES of SUN from MOON'S N.L.

Watch.			Distances.		
H.	M.	S.	°	'	"
2	13	45	49	46	10
	16	47		46	50
	18	35		47	30
	21	25		48	20
	23	36		49	20
	25	41		49	50
	27	50		50	30
	29	31		50	50
	31	31		51	30
	34	7		52	0
	35	43		52	40
	37	44		53	10
	39	49		53	50
	42	40		54	30
	44	52		55	10

Time obs. by ☉.

Watch.			Double Alts ☉		
H.	M.	S.	°	'	"
2	49	15	87	24	30
	50	20	86	57	50
	51	17	86	34	0
	52	10	86	13	0
	53	10	85	47	20

Index Error .. 10"+  
 ,, .. 15"+  
 ,, .. 10"+

Bar. 26.50.  
 Ther. 72°.

(F.)

Na-erh-pa; same evening (7th April, 1878).

NOTE.—Subtract four seconds from all times.

Observed with Sextant C.

Bar. 26.70. Ther. 70°.

Time obs. Star E.				Time obs. Star W.			
Watch.			Double Alts. Regulus.	Watch.			Double Alts. Betelgeuz.
H.	M.	S.	° ' "	H.	M.	S.	° ' "
7	5	39	119 13 30	7	26	15	91 11 20
	7	12	119 49 20		27	24	90 43 10
	8	40	120 23 0		28	30	90 16 20
	9	55	120 52 10		29	38	89 48 10
	11	10	121 20 30		30	42	89 22 0

DISTANCES of POLLUX from MOON'S F.L.

Watch.			Distances.		
H.	M.	S.	°	'	"
7	39	31	42	10	50
	42	34		10	10
	45	28		9	0
	47	31		8	10
	50	8		7	10

DISTANCES OF POLLUX from MOON'S F.L.—*continued.*

Watch.			Distances.		
H.	M.	S.	°	'	"
	53	15		5	0
	56	31		3	30
	58	15		3	0
8	0	15		2	30
	2	31		1	0
	6	11	41	59	40
	8	2		58	30
	9	52		58	0

Time obs. Star W.			Time obs. Star E.		
Watch.			Watch.		
H.	M.	S.	H.	M.	S.
8	16	21	8	26	55
	17	33		28	13
	18	32		29	23
	19	44		30	29
	21	0		31	46

Double Alts. Procyon.

Double Alts. Benetnasch.

°	'	"
109	30	0
109	4	0
108	44	30
108	19	0
107	50	50

°	'	"
78	59	10
79	24	10
79	46	10
80	7	30
80	32	40

Bar. 26.87. Ther. 66°.

RESULTS: By Sun (E.) .. .. 103 1 15  
 ,, By Pollux (F.) .. .. 102 26 15

102 43 45 E. long.

(G.)

## OBS. FOR COMPASS VARIATION.

					Var. E.
1	Mar. 1876	YUNNAN-FU	..	..	° 50
2	Aug. 1877	Lu-ku	..	..	3
3	..	Ning-yuan Fu	..	..	4 30
4	Sept. ..	Hsiao-kao-ch'iao	..	..	3
5	..	T'ieh-hsiang-fang	..	..	4 45
6	..	Hui-li Chou	..	..	5 40
7	..	Chiang-chou	..	..	4 25
8	..	Lo-po-ti	..	..	6 30
9	..	Ai-chuo	..	..	5 15
10	Oct. ..	Yeh-chu-chai	..	..	30 (?)
11	..	Short distance from preceding	..	..	7 30
12	..	Hsin-tien-tzu	..	..	4 10
13	..	Two miles north of preceding	..	..	4
14	..	Ya-k'ou	..	..	3 20
15	..	Yu-fang-kou	..	..	3 30
16	Feb. 1878	Sü-chou	..	..	3
17	..	Tao-ssü-kuan	..	..	2 30
18	Mar. ..	Lu-lu-p'ing	..	..	4 30
19	..	Mount Ma-lieh	..	..	4 35
20	..	Lao-wa-hsüan	..	..	7 25
21	..	Tzu-ta-ti	..	..	7 50
22	April ..	Hsiao-ma-ch'ang	..	..	4 50
23	..	Ta-chien-lu	..	..	8 50
24	May ..	Lu-ting-ch'iao	..	..	4 30

(H.) COMPARISON of RESULTS with those accepted by the JESUIT  
SURVEYOR, and by LIEUT. GARNIER.

PLACES.				Jesuits.			Lieut. Garnier.	
Ta-chien-lu .. ..	Lat.	30° 3' 6"		0	1	1	0	1
" .. ..	Long.	102 18						
O-mei Hsien .. ..	Lat.	29 34						
" .. ..	Long.	103 47						
Chia-ting Fu .. ..	Lat.	29 34		29	27	30		
" .. ..	Long.	104		103	55			
Fu-lin .. ..	Lat.	29 21 10						
" .. ..	Long.	102 57						
Ch'ien-wei Hsien .. ..	Lat.	29 10		29	9			
" .. ..	Long.	104 11		104	8			
Sü-chou Fu .. ..	Lat.	28 46 50		28	38	25		
" .. ..	Long.	104 51 30		104	45	38	104	30
P'ing-shan Hsien .. ..	Lat.	28 39 8		28	31			
" .. ..	Long.	104 25		104	18	30		
Yüeh-hsi T'ing .. ..	Lat.	28 39						
" .. ..	Long.	102 43						
Fu-kuan-ts'un .. ..	Lat.	28 37						
" .. ..	Long.	104 10						
Lui-po T'ing .. ..	Lat.	28 18 30						
" .. ..	Long.	103 50						
Ning-yuan Fu .. ..	Lat.	27 53 30		27	50			
" .. ..	Long.	102 27		102	12			
Yung-shan Hsien .. ..	Lat.	27 48						
" .. ..	Long.	103 52						
Chao-t'ung Fu .. ..	Lat.	27 20 35		27	20		27	26
" .. ..	Long.	103 53		103	50		103	25
Ch'iao chia Ting .. ..	Lat.	26 54 50						
" .. ..	Long.	103 5						
Hui-li-chou .. ..	Lat.	26 39					26	38
" .. ..	Long.	102 26					102	11
Tung-ch'uan Fu .. ..	Lat.	26 25		26	21		26	25
" .. ..	Long.	103 25		103	25	40	103	2
Hsün-tien-chou .. ..	Lat.	25 33 50						
" .. ..	Long.	103 19						
Yün-nan Fu .. ..	Lat.	25 2 40		25	6		25	4
" .. ..	Long.	102 41 30		102	51	40	102	36
Lu-fêng Hsien .. ..	Lat.	25 9		25	12			
" .. ..	Long.	102 2 30		102	14			
Kuang-t'ung Hsien .. ..	Lat.	25 10 20		25	15			
" .. ..	Long.	101 40 30		101	55			
Ch'u-hsiung Fu .. ..	Lat.	25 1 45		25	6			
" .. ..	Long.	101 26 10		101	43			
Chên-nan-chou .. ..	Lat.	25 11 10		25	16			
" .. ..	Long.	101 9 40		101	24			
Chao-chou .. ..	Lat.	25 35		25	38			
" .. ..	Long.	100 13 28		100	31			
Ta-li Fu .. ..	Lat.	25 41 50		25	44	25	25	44
" .. ..	Long.	100 3		102	22		100	27
Yung-ch'ang Fu .. ..	Lat.	25 7 10		25	4	50		
" .. ..	Long.	99 6		99	26			
T'êng-yüeh .. ..	Lat.	25 1 45		24	58			
" .. ..	Long.	98 24		98	45			

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